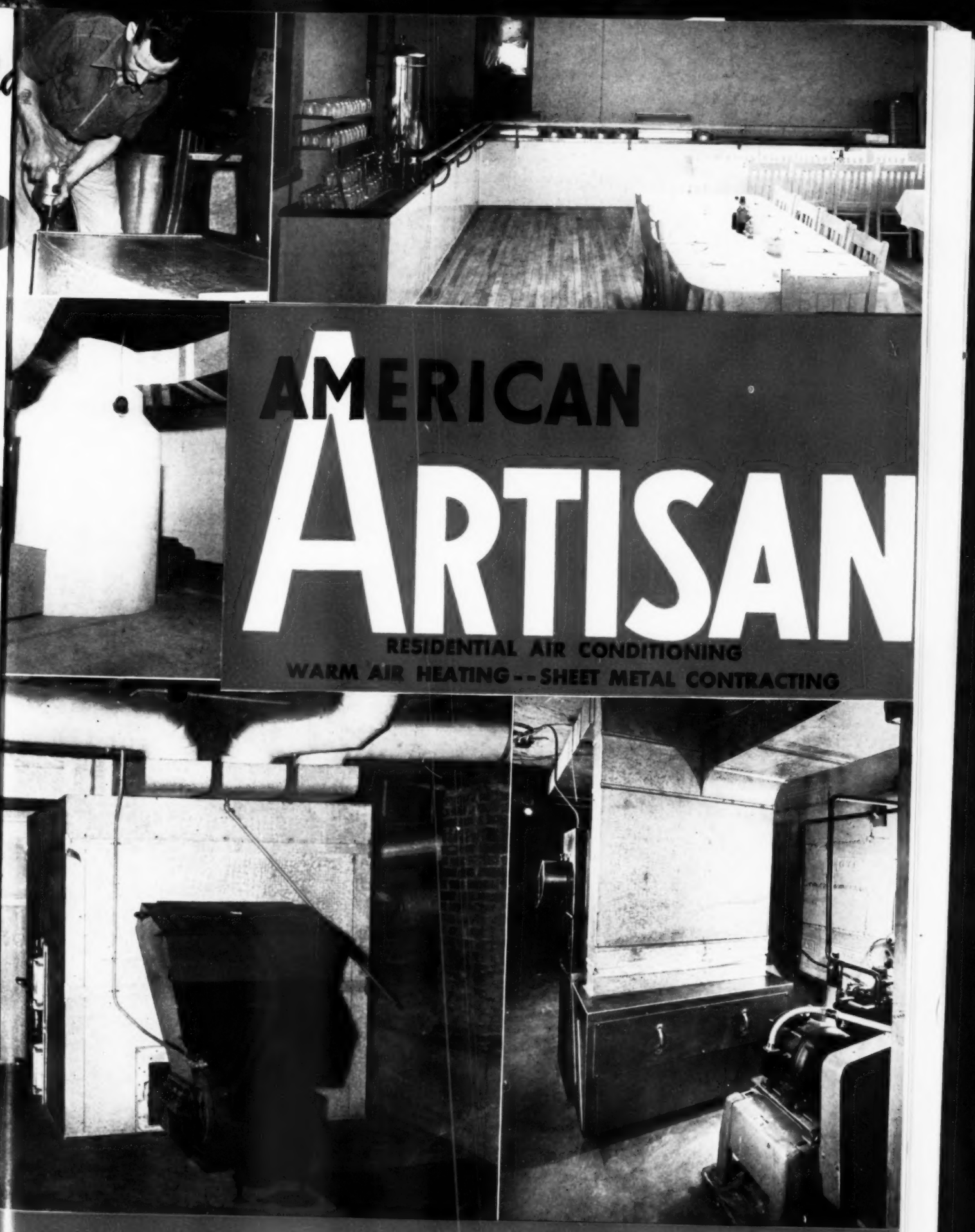

AMERICAN ARTISAN

RESIDENTIAL AIR CONDITIONING
WARM AIR HEATING -- SHEET METAL CONTRACTING

MAY, 1947

Time Lag in Panel Heating Systems - - - - - - - - - - - - - - - - 69
"How to Do It"—Build a Truck Furnace Cleaner - - - - - - - - - - 73
Ventilation for Spray Painting - - - - - - - - - - - - - - - - - 79

OVER A MILLION SATISFIED HOME OWNERS USE AIR CONTROL REGISTERS AND GRILLES

This amazing record is positive proof that America's leading heating and air conditioning installers want satisfied customers—they choose AIR CONTROL. Air Control's outstanding engineering and manufacturing skill have given AIR CONTROL products the distinctive qualities that give these products such wide acceptance as the really fine registers and grilles of the industry.

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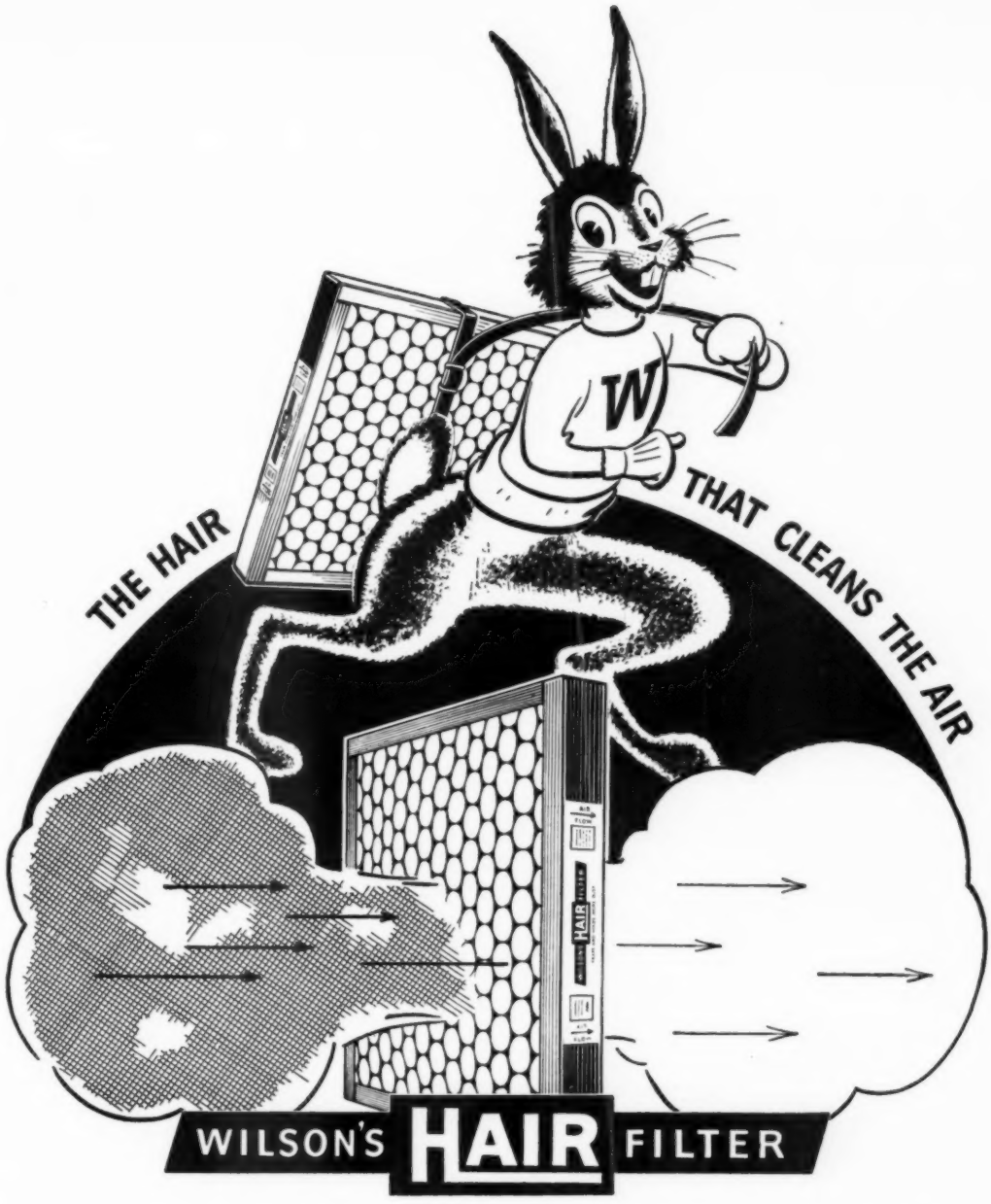

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TRAPS AND HOLDS MORE DUST

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT

AMERICAN ARTISAN

with which is merged FURNACES SHEET METALS Warm-Air Heating

Covering All Activities in Residential Air Conditioning and Small Commercial Cooling, Warm Air Heating, Sheet Metal Contracting and Fabricating

J. D. Wilder, Editor

J. J. McCullough, Associate Editor A. A. Kennedy, Assistant Editor

Contents

The Editor's Notebook 6
Getting Ready for the Adjustment Period 57
"Bureaus" on the March Again 58
How to Reduce Payroll Taxes (Part 6) 60
Cut Your Price—Not Your Throat! 62
News Summary of the Month 64
SMCNA National Convention 89
Warm Air "Short Course" 94
The New York Convention 95
Association Activities 99
Equipment Developments 107
New Literature 128
With the Manufacturers 134

RESIDENTIAL AIR CONDITIONING SECTION

"Stucco's" Cause Evaporative Cooling Skeletons 67
"Time Lag" in Floor Panel Depends on Floor Mass 69
One Way to Build a Truck Furnace Cleaner 73

SHEET METAL SECTION

Ventilation For Spray Painting 79
Duct Sizing Charts (Part 3) 85

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In This Issue

ONE OF the questions arising from the use of warm air floor panel systems where the floor is a heavy mass of concrete or tile or combinations is how to control inside temperatures in mild weather or on sunny days when little heat is needed but the slab has been heated up during the night preceding.

On page 69 Warren Wilson delves into this problem and suggests that the mass of the slab lying underneath the space through which the warm air flows through the panel is responsible for both "lag" and storage—therefore reducing the mass or insulating the mass from the warm air may be one way of preventing accumulation of unwanted heat.

•

Every so often AA receives a letter from a reader who wants to buy one of the big, bag-type cleaners which stand outside the house and attract all the kids in the neighborhood. And, incidentally serves as "can't-be-missed" advertisement for the contractor.

Such cleaners used to be available, but, today, if a dealer wants such a truck cleaner he has to build it. On page 73, an AA reader describes in detail how he built such a cleaner; explains so clearly that most any contractor can build a duplicate or have one built.

•

If you want to know what the industry is talking about and planning to do about our problems, the report of the SMCNA convention on page 89 should give all the answers.

Founded 1880

MAY, 1947

Volume 116, No. 5

USE Sal-Mo Asbestos #77 DUCTBOARD

the Quick, Easy Way to Make Cold Air Return Ducts

AN asbestos product developed and manufactured for the construction of ducts in warm air heating and ventilating systems. It is made to do the same job that is also done with metal.

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Scientific treatment to prevent moisture absorption. It can be used any place where high relative humidity prevails.

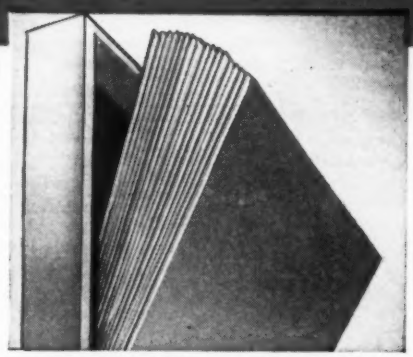
EASILY HANDLED

SAL-MO No. 77 Ductboard is a time saver. Sheets are 33" x 48", the exact size for covering two joist openings spaced at 16" centers. This makes two cold air return ducts. It is easily cut with saw, knife or snips and is applied with hammer and wallboard tacks or with a stapler. It is easily fabricated into square or rectangular ducts.

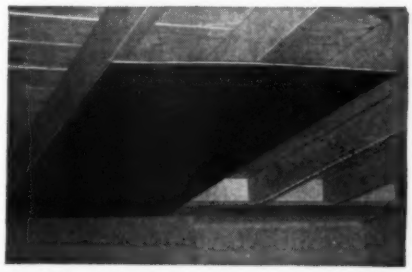
ATTRACTIVE IN APPEARANCE

Its attractive gray finish may be painted or plastered after installation.

See Your Jobber—He Can Supply You with SAL-MO No. 77 Asbestos Ductboard



Smooth finished, rigid . . . Sal-Mo No. 77 Ductboard is light in weight and durable. Packed in convenient cartons.



Sheets are 33"x48"—exact size to cover two joist openings at 16" centers.

(Below)—Applying No. 77 Sal-Mo Ductboard to make two cold air return ducts.

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The Editor's NOTE BOOK

Reprint of Press Brake Articles

An American Artisan reader who has been in the contracting business, but is now planning to engage in sheet metal manufacturing writes that of all the articles appearing in American Artisan, he finds most helpful the series of articles on "Making The Most of Your Press Brake" by Ernest Zideck. For the benefit of other readers interested in this series, A. A. takes this occasion to announce that the series was completed a couple of months ago and that within a short time a reprint booklet will be available, containing all of the articles in this series. An announcement will be made when the booklet is available, but meanwhile any reader interested can drop us a note and his name will be placed on a list to receive a first copy.

◆

Steel Roof Decking

At a recent convention an extemporaneous forum on steel roof decking disclosed that of approximately 75 sheet metal contractors in the group not more than eight had applied any steel decking in the last twelve months. The difficulties cited seemed to be as follows:

1—Too many sheet metal contractors are not interested in decking.

2—Some contractors are unable to obtain steel decking because the manufacturers prefer to sell the decking to the structural iron contractor.

3—A number of contractors reported that the local sheet metal union was unable to furnish sufficient mechanics to install the job.

4—The forum developed that the going price for steel decking is approximately $21.00 per square legitimate, up to $25.00 per square illegitimate. Also that most decking is applied by tack welding and the cost of getting the decking in position and welded runs from $5 to $6 per square. Several contractors reported selling steel decking at $40.00 per square, which seemingly should provide a very handsome profit at the costs listed above.

◆

Prefab Is Picking Up

With more than 200 manufacturers turning them out, prediction is made that the output of prefabricated homes will reach a record mark of 125,000 this year.

Slowing down the manufacturers' attempt to help solve the acute housing famine are such obstacles as materials shortages, opposition by some local builders and labor unions, and building code restrictions.

After a year of production difficulties which closed several plants and left others operating at only 10 to 30 per cent of capacity, operating rates of some of the larger companies are reported to have increased 50 to 100 per cent during the past three or four months.

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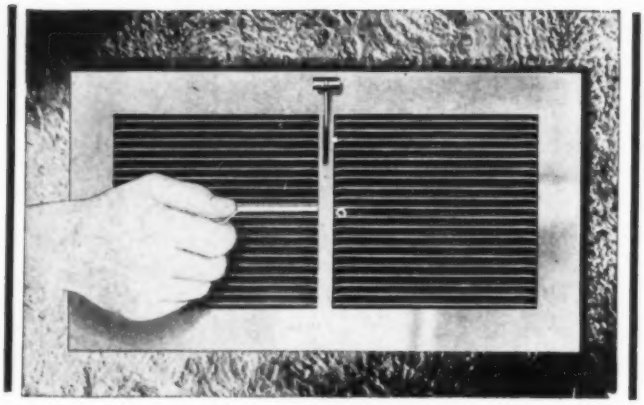

H&C No. 741 Sidewall Register

Low-Cost Insurance for Customer Satisfaction

For your low-cost air conditioning jobs the No. 74 Design Register is unquestionably the best medium-priced register you can use.

It is quality-built in every detail and provides any upward or downward deflection desired. The result is better air distribution, more customer satisfaction and good-will.

New equipment and new methods have been incorporated in our production set-up which will make possible greatly increased volume of production when sufficient materials are obtainable.

In the meantime, we're doing our best to distribute our production on a fair and equal basis. Cooperate with your jobber by adhering to the sizes recommended by the N.W.A.H. & A.C.A. standardization program. These sizes are clearly indicated in our Catalog No. 46, available from your jobber.

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World's Largest Manufacturers of Registers, Grilles, Furnace Accessories

HOLLAND • MICHIGAN

The Editor's NOTE BOOK

What White-collar Workers Want

Demands of the Federation of Westinghouse Independent Salaried Unions give a quick view of what the upper level of white-collar workers, including engineers and technicians, really expect. The union is tough, independent, non-Communist, and not company-dominated.

Cost-of-living bonus of 16%; "just and equitable pension plan"; additional vacation time for 10-year service; severance pay; attendance bonus; payment for time spent traveling away from plants and over eight hours a day; increased mileage allowance for personal cars; better scheduling of overtime; and increased traveling allowances.

These are the demands of a usually inarticulate group within industry. Unvoiced, they are probably the uppermost desires of most white-collar employes.

◆

Gas Directly From Coal

A recent, revolutionary scientific discovery opens the way to the conversion of bituminous coal into gasoline and gas fuel of high heat value. Plants now on the drafting board will convert fifty tons of coal into 2.4 million cubic feet of gas. Industry will benefit through lower transportation costs and conservation of the nation's oil supply (since the conversion process would yield gasoline as well as fuel gas).

More coal will be used, but less miners may be needed if the project is combined with a new mining technique: mine walls could simply be pulverized, with pipes sucking up the powder. This would increase the production per man day to 100 tons per miner.

Another method proposes the underground gasification of coal mines. This would do away with coal miners altogether: the seams of the mine would be set afire, oxygen would be pumped in to keep the fire going. The resulting gas would be drawn out for use as fuel and for conversion into gasoline.

These two mining processes are still in the future, but they give every promise of being practical and feasible.

◆

Aftermath of the War

"Vast, world-wide depletion of goods and industrial equipment has made adequate replacement a job requiring years to complete," says the DoAll Company. "In addition to natural replacement needs based upon pre-war standards, the present pyramiding demand for more and better goods goes far beyond industry's capacity. One reason is the world wide spread of knowledge of the American high standard of living—knowledge which resulted from close association of the average American with all peoples abroad during the war."

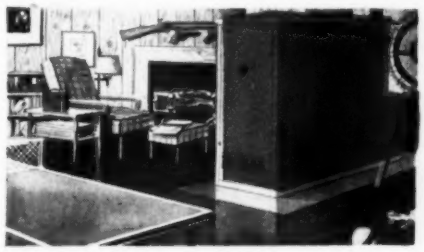
Sell fully automatic indoor comfort

MEYER GAS-FIRED AIR CONDITIONER

You'll be proud to show this superb modern Meyer Gas-Fired Air Conditioner . . . and even more pleased with the immediate acceptance it wins from your prospects. It leads in efficiency and economy. Designed for easy installation and freedom from servicing. This Meyer Gas-Fired Air Conditioner provides the completely automatic heating, circulation, cleansing, and humidification expected in modern heating. There is a complete Meyer line of gas-fired heating equipment, including hi-boy and gravity models. The name WEIR-MEYER is your assurance of dependable, lifetime heating equipment, built with features to help you sell and backed by sound, aggressive advertising and merchandising. Write for franchise details.

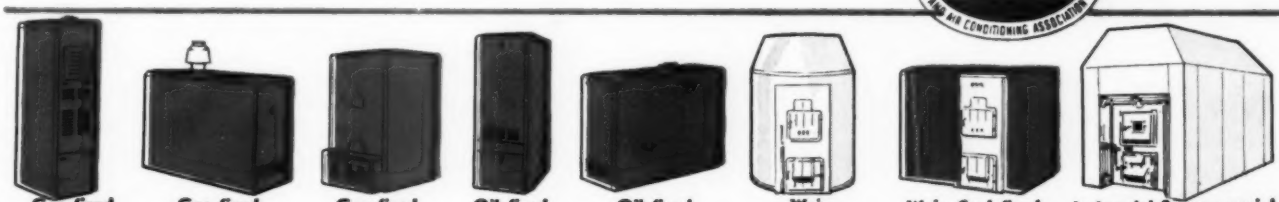
THE MEYER FURNACE COMPANY,
Manufacturers of steel furnaces and air conditioners for GAS — OIL — COAL. *Offices:* PEORIA 2, ILL., *Factories:* PEORIA *and* PERU, ILL.

Cutaway view above shows mechanical construction of Meyer "F" series Gas-Fired Air Conditioner. It's easily installed, free from service worries. Smartly styled for modern homes.

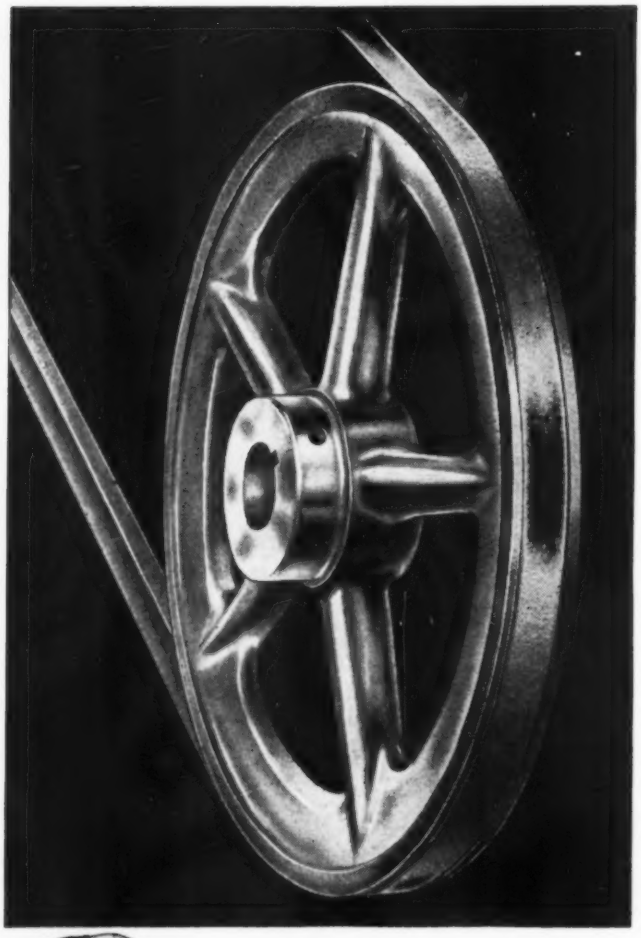


WEIR-MEYER means modern heat

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION — INDOOR COMFORT



Gas-fired Hi-boy | Gas-fired Air Conditioner | Gas-fired Gravity | Oil-fired Hi-boy | Oil-fired Air Conditioner | Weir Steel furnace | Weir Coal-fired Air Conditioner | Industrial & commercial heating equipment



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For unfailing, continuous operation be sure to specify Maurey V-Pulleys.

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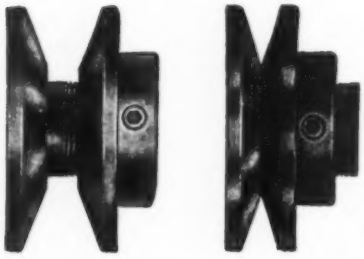


The Editor's NOTE BOOK

More Output Per Day

"Low productivity" of labor has a substantial effect on costs of small homes built for sale, say members of the Long Island Home Builders Institute.

"To illustrate, before the war bricklayers used to lay 800 to 1,000 brick a day on small house construction. At a daily wage of $8 this meant a bricklayer labor cost of 8/10ths of a cent per brick, or on a typical house using 9,000 brick, a bricklayer labor cost of $72. Today, the average production is 400 to 500 brick a day. At daily wages of $18.03, which includes six paid holidays a year, this is a cost of 3.6 cents a brick, or $324 for the typical house. It takes 54 more hours of bricklayer labor to lay the 9,000 brick as compared with pre-war. At the current wage levels this adds $139 to the construction cost of the house solely through lower productivity and is the measure of the reduction in costs that might be effected if labor could be induced to step its production up to the pre-war rate."

"This condition of low productivity," say the L. I. builders, "concerns serious minded union labor leaders as much as it concerns builders. Labor is prone to say that management must solve this problem; builders generally consider that the fault lies with labor leaders. Actually, it is a job that calls for strong, affiirmative and aggressive leadership both in labor and management to jointly tackle this problem in terms of ultimate construction costs and final sales prices. It must be done by all trades and all builders. If it can be achieved wage increases will then stand or fall directly on their own merits and without being complicated by the self-multiplication of cost created by low productivity."

◆

Little Business in Big Beehives

When the government closed down its $14,000,000 bomber plant covering 259 acres and including 18 buildings in Birmingham, Ala., after V-J Day, things looked black for the community as well as for the 19,000 men and women thrown out of work.

Instead of letting the huge installation go to the scrap heap, however, a group of businessmen with vision and money to invest, began taking over.

The plant was too expansive and expensive for one single industry, so a collection of smaller businesses began leasing parts of it. Two businessmen who had been making grenades turned to making auto jacks and children's wagons; others followed suit.

Today the white elephant is a beehive of small industries—manufacturers of radios, kitchen cabinets, doors, screens, hardware, chemicals, truck equipment, etc., giving jobs to thousands and products to the public.

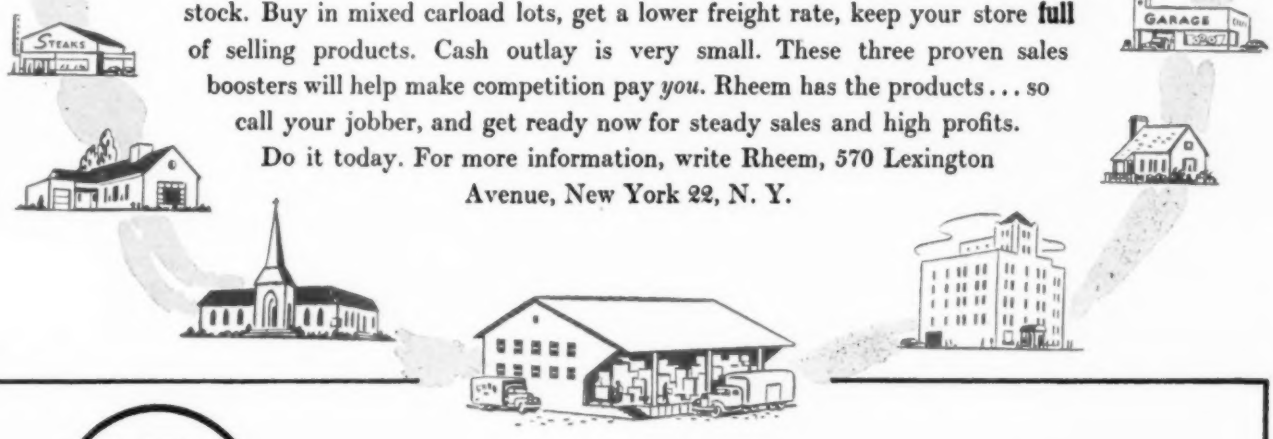
HEATING DEALERS: Competition's Coming Back!

• Rheem brings you the plan and the products to make competition pay!

1 Carry the newest kind of heating equipment . . . the kind home builders are all talking about. New **winter air conditioners** that give filtered, humidified, circulated warmth. New **floor furnaces** that bring modern good looks, modern economy. Brand new **stokers** that save up to 50% on fuel, economical **space heaters,** compact **wall heaters.** Meet new competition with new products . . . RHEEM products.

2 Carry a range of sizes and types to fit any heating need. Units for **any fuel** . . . gas, coal, oil. Units for **any use** . . . cottage, home, factory, church. Units for **any budget** . . . de luxe and standard models. Rheem brings you the *complete* heating line that sells *every* prospect.

3 Carry a large stock *on hand.* Your customers will **buy** more if they can **see** what they buy. Rheem's flooring-credit plan makes it **easy** to carry a large stock. Buy in mixed carload lots, get a lower freight rate, keep your store **full** of selling products. Cash outlay is very small. These three proven sales boosters will help make competition pay *you.* Rheem has the products . . . so call your jobber, and get ready now for steady sales and high profits. Do it today. For more information, write Rheem, 570 Lexington Avenue, New York 22, N. Y.



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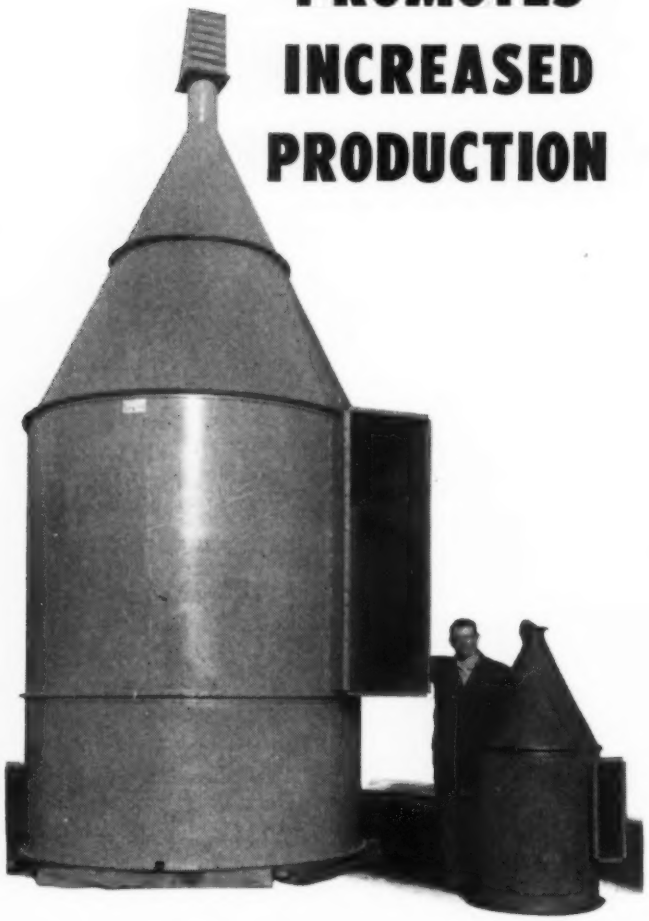
RHEEM ... *making houses into homes*

DUST-FREE AIR PROMOTES INCREASED PRODUCTION



● Dust-free air is an important factor in worker's efficiency. Respirators and masks are a nuisance and prevent men from putting forth their best efforts.

The simplest, surest and most satisfactory way to solve a dust problem is by installing Morse Rarefied Collectors on dusty operations. We make them in a wide range of sizes. The large unit shown here will handle 16,000 C. F. M. of heavy dusts. The small one will handle 1100 C. F. M.

Goergen-Mackwirth collectors are highly efficient. Their first cost and maintenance is low. They are self-dumping. No cleaning is necessary. There are no replacement bags, plates or oil spray. The only electric current required is for the fan motor.

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SPECIALISTS IN THE MOVEMENT AND CONTROL OF AIR

The Editor's NOTE BOOK

Reprint of Panel Heating Articles

Beginning last October, American Artisan began publication of a series of articles describing actual test results obtained in a number of warm air panel systems. A variety of different types of floor construction will be reported in the series and the articles will be continued until late in 1947. At the conclusion of the reports of actual tests, American Artisan proposes, with aid of Professor Konzo of the University of Illinois and other engineers, to prepare and publish a simplified formula for the design of floor panel systems. When the reports are concluded, American Artisan proposes to reprint the articles in a booklet which will be made available to readers.

◆

Phenomenon On Phenomenon

A "hot-cold pipe" that converts ordinary compressed air into both hot and cold air without the aid of moving parts has been built by Westinghouse Research Engineers. As yet scientists have no explanation for the phenomenon though it is conjectured that the cause may be a frictional effect between gases moving at different velocities.

In operation, compressed air is pumped into a nozzle at one end of the pipe. There it strikes the inner wall of the pipe tangential to the diameter and is converted into a whirlpool of spinning gases. The air in the center becomes cold almost instantly while that on the periphery gets warm. The cold air is drawn off through an opening at the center of one end, while the warm air is tapped from the periphery.

With the original tube 3/10ths increase in diameter, R. Hilsch, its German inventor, claims to have produced simultaneous jets at 154 degrees F. and 10 degrees F. The present model, 15 inches long and 1 inch in diameter, was purposely constructed larger in diameter to expedite instrumentation for scientific study. For this reason it gives a temperature difference of only several degrees F.

Low efficiency rules out commercial application at this time, but like the "blue glow" in Edison's experimental electric light that led to his invention of the first electronic tube, it may lead to unexpected developments. Even now it holds promise as a handy laboratory tool for making cold as simply as a Bunsen burner makes heat.

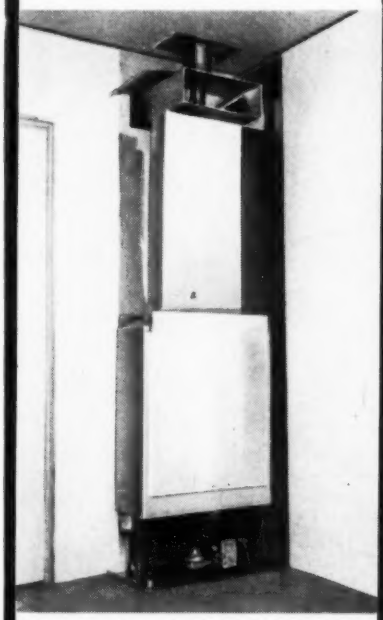
◆

Progress

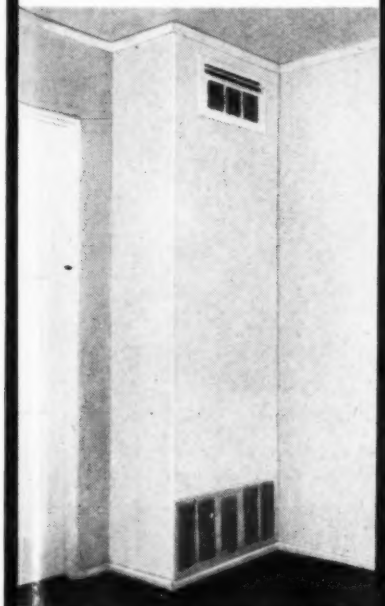
Eighty-six years ago this advertisement appeared in a San Francisco newspaper—"Wanted. Young, skinny fellow, not over 18. Must be extra bright, willing to risk death daily. Orphans preferred. Wages $25 per week. Apply Central Express, Alton Building, Montgomery St."

That was the birth of the Pony Express, mail from St. Joseph, Mo. to San Francisco, ten days. Today, by air mail we do it in ten hours or less.

The burner and fire-box are in position and connected to gas lines. Prefabricated parts including registers are ready for quick assembly.



The outer-casing and radiation shield are lifted into place. The riser, register head, vent pipe and condensation box are placed in position.



The pre-cut covering that conceals heating unit is assembled by carpenter. Cold air intake is at bottom and hot air register 6" below ceiling.

ROYAL JET-FLOW out-performs

other heating units costing three times as much

Typical view of an installation in Kaiser Community Homes Project.

Royal Jet-Flow is easy to sell, easy to install in new homes or homes already built. The *Royal* creates new markets—added profits. For the *Royal* gives two-way heating—high velocity circulation plus ceiling radiation. The *Royal* circulates pure warm air to all parts of the house with a minimum of temperature variation from room-to-room and ceiling-to-floor. *Independent laboratory tests, conducted in a five room house, with controlled outside temperature of 30° F, showed a maximum room-to-room temperature differential of 4° at a height of 60 inches.* Royal *Jet-Flow* is available for immediate delivery—write for information and prices.

SPECIAL FEATURES: **1.** Easy to adapt into floor plans—allows architect freedom in his design. **2.** Simple inexpensive installation—in any type home. **3.** High velocity output of 250 feet per minute achieved through use of venturi principle—in effect forced air without blower or fan. **4.** Installed above floor—simplifies heating problems in concrete slab construction. **5.** Heats entire house of average size with a minimum of temperature differential from room-to-room and ceiling-to-floor. **6.** Fire-box constructed of low alloy high tensile steel for greater resistance to deterioration. **7.** Corrugated fire-box of even thickness—designed to eliminate noise caused by expansion and contraction. **8.** Engineered for safe operation—scientifically vented, both burner and pilot valve equipped with safety lock. **9.** Hot air outlet out of reach of children. **10.** Attractive registers fit inconspicuously into any style of decoration. **11.** Carries American Gas Association Seal of Approval—guaranteed. **12.** Thoroughly tested—over 3000 installed and in use.

Send today for charts giving ideal home heating temperatures, and results of tests conducted on forced air, space, wall, floor, and Jet-Flow heating units under identical circumstances by independent laboratory.

ROYAL HEATERS, INC.

1024 WESTMINSTER AVENUE, ALHAMBRA, CALIF., DEPT. A-5

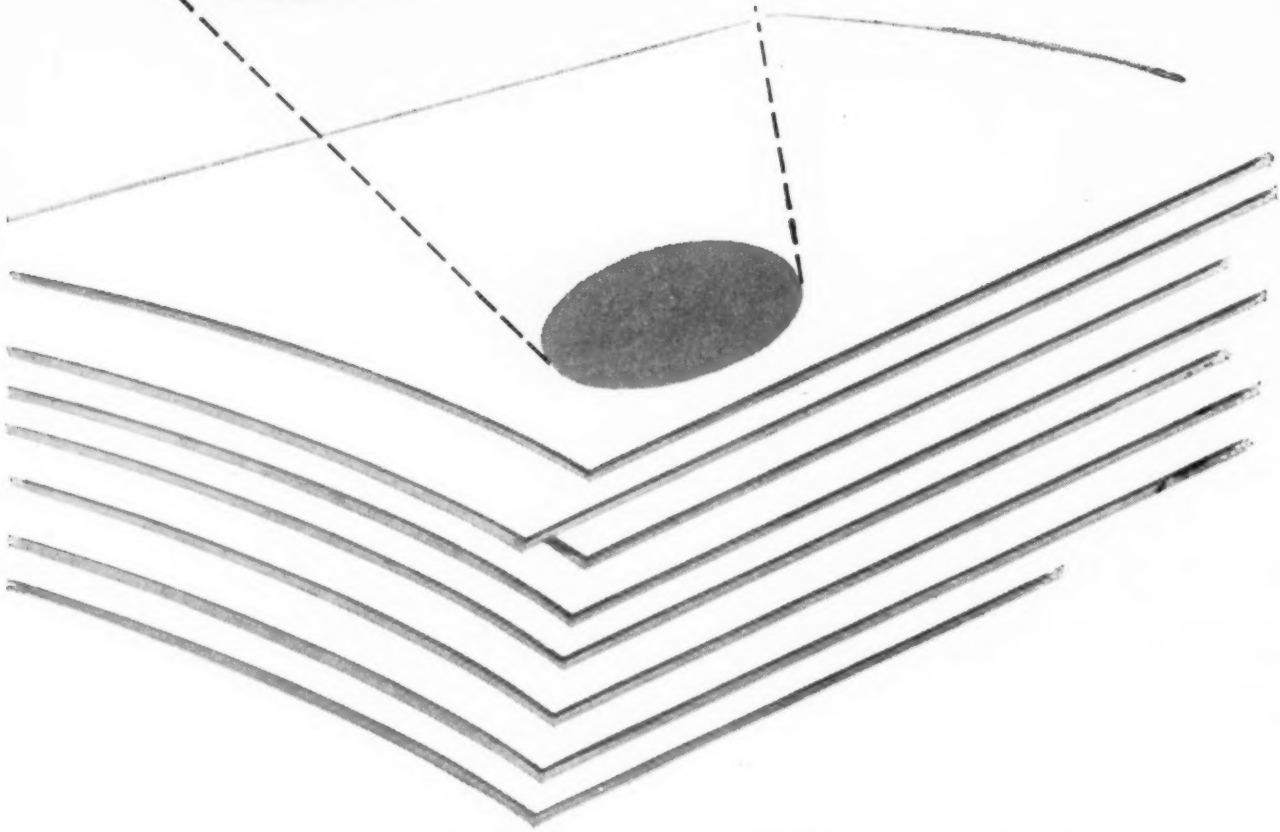
© 1947 ROYAL HEATERS, INC.
PAT. APPLIED FOR.

The Brand most in demand...

The familiar U·S·S trademark is the best-known symbol of quality steel in the industry. It has a sales value second to none!

Even though, at the present time, many buyers of steel sheets are using whatever they can find, most would rather be using their old stand-bys—the sheets with the U·S·S trademark. And it's this insistence on top quality, this loyalty to a dependable product, that helps the man who sells and works with U·S·S Steel sheets to hold his customers during periods of scarcity, that helps him to build up a bigger business when materials are plentiful.

So keep asking your jobber for these easier-to-fabricate, good-looking, long-lasting sheets. Shipments are going out to jobbers as rapidly as possible—it's possible that he may now have just what you need.

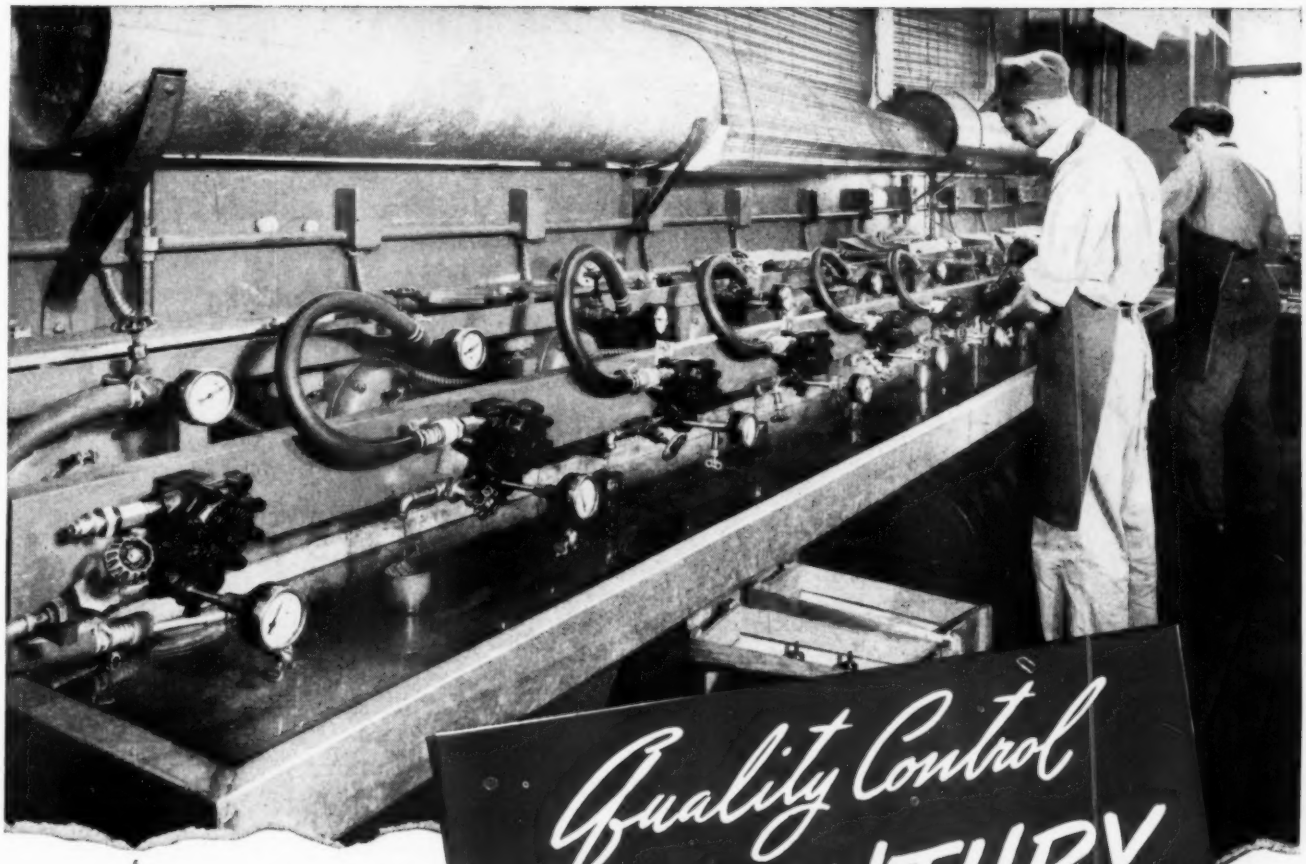


CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
TENNESSEE COAL, IRON & RAILROAD COMPANY, *Birmingham*

United States Steel Supply Company, Chicago, *Warehouse Distributors*
United States Steel Export Company, New York

7-569

UNITED STATES STEEL



Century pumps are thoroughly tested by the pump manufacturer before shipment. At Century they are again tested as shown in the above picture. They are checked for the third time during the final fire test of the complete burner.

Quality Control AT CENTURY ASSURES LOW MAINTENANCE COSTS

MODEL "L" OIL BURNER

Domestic water units and boiler burner units have been temporarily discontinued from our line due to material shortages.

WHEN it bears the Century trademark, you know you're getting the best on the market—a product built to perform. As it goes along the assembly line, each individual part is submitted to a rigorous test, with accurate instruments catching even the slightest defect. Built with watchlike precision, no burner is shipped that fails to pass each of the tests that are devised to duplicate actual operating conditions in your home. In addition to these tests, each burner is placed in a regular furnace and fire tested. This is your guarantee of perfect performance from the very beginning.

Dealers who keep accurate cost records consistently report that the strong, substantial construction of Century equipment makes servicing easy and economical. Inquire about a profitable Century franchise soon.

CENTURY
Engineering Corporation
CEDAR RAPIDS, IOWA

OIL BURNERS • BOILER-BURNER UNITS • WARM AIR FURNACES
HUMIDIFIERS • WATER HEATERS • AIR CONDITIONING

HUSSEY COPPER

The Lifetime Metal for the Modern Home

Building Layout
Courtesy American
Artisan

Hussey Copper *fits today's needs*

This typical house plan illustrates 41 business opportunities in the modern home for sheet metal work or related services within your scope. Shown in color are a few of the many points where Hussey Copper will lend easy workability, enduring quality and lifetime permanence and beauty that stamps *your* installations as the best.

- **Copper Sheet** • **Copper Strip**
- **Copper Nails and Rivets**
- **Copper Ridge Roll—Copper Eave Troughs**
- **Copper Conductor Pipe**

C. G. HUSSEY & COMPANY
(DIVISION OF COPPER RANGE CO.)

ROLLING MILLS AND GENERAL OFFICES: PITTSBURGH, PENNSYLVANIA

Hussey Warehouses carry stocks of Copper and Brass Products for prompt shipment.

Hand Workmanship Brings Fancy Prices in Men's Tailoring... ...But NOT IN SHEET METAL WORK!

Nobody is interested in hand craftsmanship insofar as duct work is concerned . . . and certainly no one will pay a premium price to get it. Differences in *production cost* is YOUR problem . . . represents the difference in YOUR profit on the finished job.

With a Lockformer, you can make ducts many times as fast as by hand methods . . . ducts that are better looking, more uniform, easier and faster to assemble. If you plan on *any* duct work, and you *don't* have a Lockformer, why not ask yourself this simple question: "What am I waiting for?"

LOCKFORMERS HANDLE ALUMINUM, TOO . . .

. . . with no changeover whatever. Complete data, resulting from tests made by Lockformer engineers, are yours for the asking.

ONE MAN WITH A LOCKFORMER CAN MAKE MORE PITTSBURGH LOCKS THAN SIXTEEN MEN WITH EIGHT BRAKES

THE LOCKFORMER CO.

4615 ARTHINGTON STREET • CHICAGO 44, ILLINOIS

Rybolt CAST IRON COAL-FIRED HEATING UNITS

Rybolt cast iron coal-fired heating units are famous for their efficiency, dependability and economy of operation. Today's models embody many important new features that have been developed by our engineering staff in accordance with the most advanced principles of present day warm air heating practice.

Rybolt CAST IRON COAL-FIRED WINTER AIR CONDITIONER—SERIES 151

This Rybolt unit is completely modern with all parts fully coordinated to make Series 151 everything that could be desired in a winter air conditioner.

Enclosed in a compact and well proportioned cabinet of simple dignified design this unit is unusually attractive. With all the cozy comfort of coal heat Series 151 combines the convenience and dependability of automatic control and even distribution of humidified warm air. For its heating element it has the well known Rybolt Series 15 cast iron coal-fired furnace.

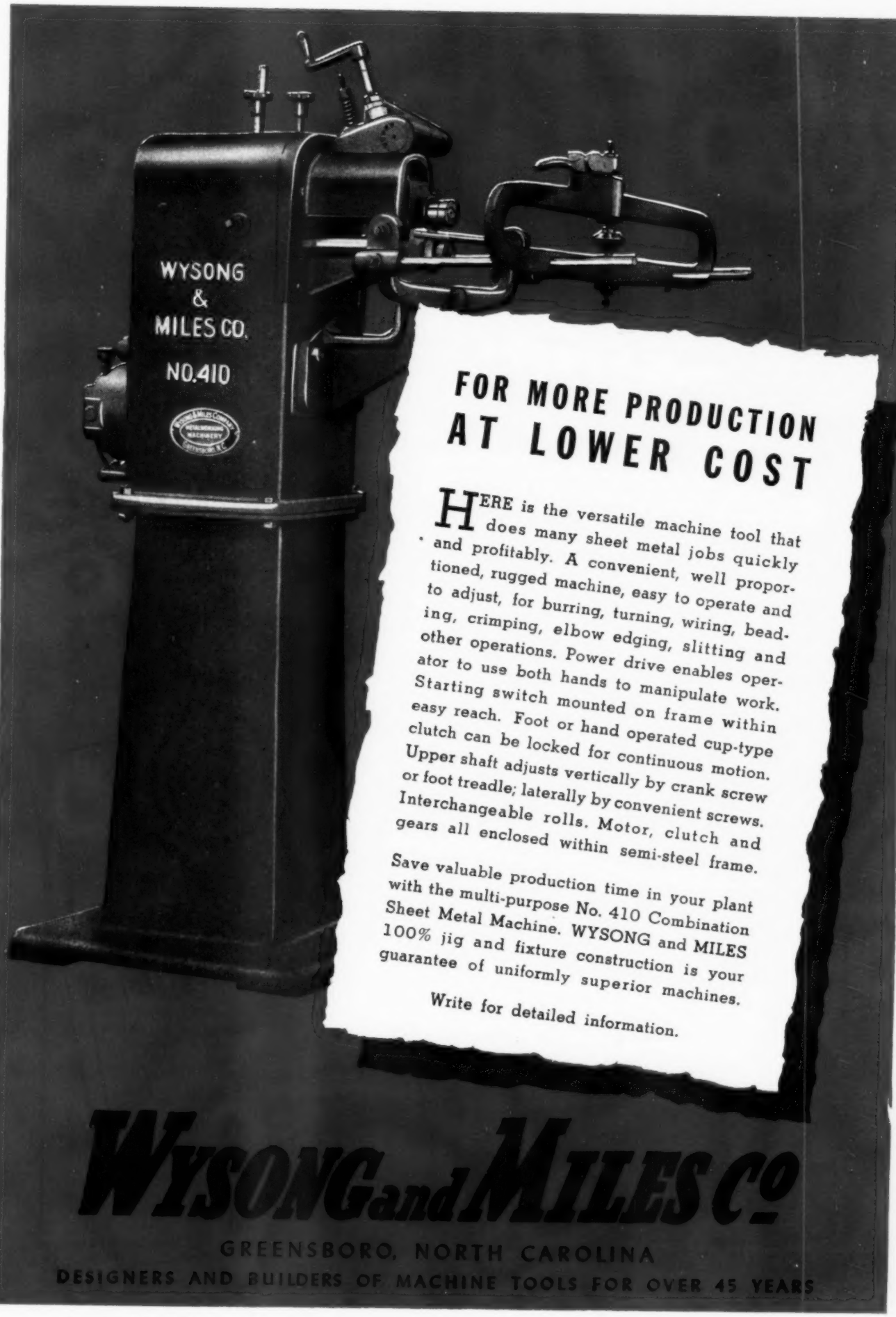
Rybolt CAST IRON COAL-FIRED GRAVITY FURNACE—SERIES 15

Rybolt Series 15 is a quality furnace throughout, attractive in appearance, designed and built for durability, utmost heating efficiency and economy.

Distinctive features are the large capacity fire bowl and combustion chamber, corrugated inside and out; extra large duplex ball-bearing grates; waist-high shaking lever; slip-on front cast construction; effective smoke consumer; smoke- and gas-tight joints; extra weight castings. 5 sizes.

THE RYBOLT HEATER COMPANY

615 MILLER STREET ★ ASHLAND, OHIO



FOR MORE PRODUCTION AT LOWER COST

HERE is the versatile machine tool that does many sheet metal jobs quickly and profitably. A convenient, well proportioned, rugged machine, easy to operate and to adjust, for burring, turning, wiring, beading, crimping, elbow edging, slitting and other operations. Power drive enables operator to use both hands to manipulate work. Starting switch mounted on frame within easy reach. Foot or hand operated cup-type clutch can be locked for continuous motion. Upper shaft adjusts vertically by crank screw or foot treadle; laterally by convenient screws. Interchangeable rolls. Motor, clutch and gears all enclosed within semi-steel frame.

Save valuable production time in your plant with the multi-purpose No. 410 Combination Sheet Metal Machine. WYSONG and MILES 100% jig and fixture construction is your guarantee of uniformly superior machines.

Write for detailed information.

WYSONG and MILES Co.

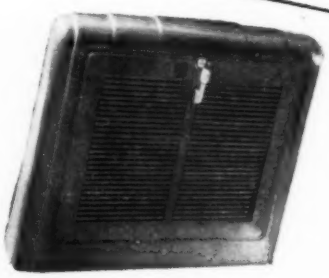
GREENSBORO, NORTH CAROLINA

DESIGNERS AND BUILDERS OF MACHINE TOOLS FOR OVER 45 YEARS

Proven in
Practical Use

It's ALUMINUM
It's Feather Light—
It's Stronger—Better Looking—
It's *CHAR-GALE—
And IT COSTS NO MORE!

Char-Gale aluminum fittings are made to give years of satisfaction to your customers. They are stronger, better looking, longer lasting. They are better for the men who do the job, too. Feather-light, they are easier and cheaper to handle and transport. And what a break their light weight is for the installer!



*Char-Gale Registers

Made of quality materials, carefully designed, these registers have a 12½ degree downward directional flow. Models for every type of installation are available.

PREFABRICATED DUCTS AND FITTINGS FOR WARM AIR HEATING

CHAR-GALE

CHAR-GALE MFG. CO. MINNEAPOLIS 6, MINNESOTA

* "NO HEATING PLANT IS BETTER THAN ITS INSTALLATION — NO INSTALLATION CAN BE BETTER THAN ONE OF CHAR-GALE FITTINGS"

Aluminum in rolls...

now available at NEW LOW PRICES!

Aluminum saves time on the job and in transit. Each pound goes as far as three pounds of heavier sheet metal. Aluminum is hard enough to be durable, soft enough to be worked on any type of sheet metal working equipment. Millions of pounds of aluminum have been used in the last six months for joist linings, ducts and fittings.

Today we can give you immediate shipment on Char-Gale Aluminum rolls!

We suggest 33" width—it can be used for fittings as well as for joist lining.

PRICE LIST *effective March 27, 1947*

ALUMINUM ROLLS

25 ½ Hard—¾ Hard Thickness—.025 (approximately the same as 24 gauge steel)

Pounds	Full rolls 500 lbs.	100-lb. rolls
30,000 and over	$0.246	$0.266
20,000 to 29,999	.248	.268
10,000 to 19,999	.251	.271
5,000 to 9,999	.271	.291
2,000 to 4,999	.276	.296
1,000 to 1,999	.281	.301
500 to 999	.306	.326
100		.346

Net Ten Days

Prices are per pound for quantities shown

Prices subject to change without notice

WRITE OR WIRE YOUR ORDERS TO ——

PREFABRICATED DUCTS AND FITTINGS FOR WARM AIR HEATING

CHAR-GALE

MINNEAPOLIS, MINNESOTA **CHAR-GALE MFG. CO.** **OMAHA, NEBRASKA**

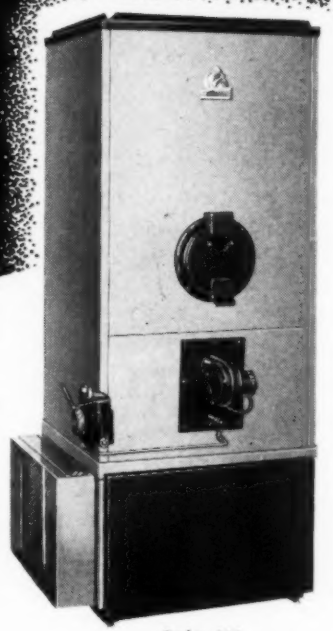
ANY OIL FIRED JOB can be a Luxaire job

WITH Luxaire's NEW 1947 OIL-FIRED UNITS

A new, complete line. Smartly styled cabinets with baked enamel finish . . . Steel heating elements with seams welded by the new, automatic submerged arc welding method . . . leak-proof cabinet base that eliminates basement platforms and grouting . . . and heat absorbing radiation shields which replace noisy inner liners.

VAPORIZING UNITS

Vaporizing pot-type units have forced draft combustion . . . fuel line cleaning device assembled as part of the burner unit . . . stainless steel flame deflector that increases economy. *AND* a new revolutionary feature in design and construction! **The installation or removal of the complete burner assembly without dismantling either cabinet or heating element.**



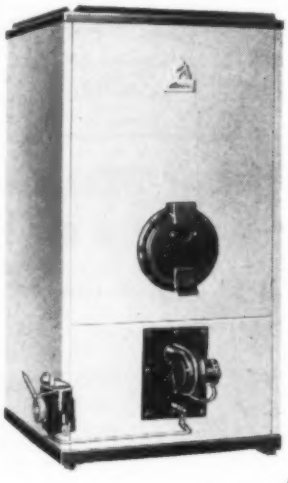
Series VH
Oil Fired Steel Utility
Air Conditioning Unit

GUN TYPE UNITS

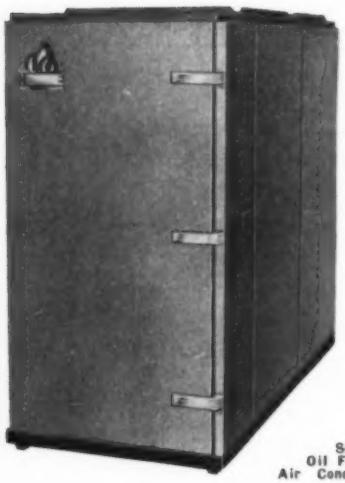
The Series "O" units embody all of Luxaire's new advanced features in design and construction. The cabinet has large, roomy vestibule that allows easy installation of most types of gun type burners. The new noiseless, tubular constructed radiator can be easily cleaned inside and out by simply removing the rear radiator plate.

Write for details and the name of your jobber.

Series VA
Oil Fired, Steel
Air Conditioning Unit



Series VG
Oil Fired, Steel
Gravity Unit



Series O
Oil Fired, Steel
Air Conditioning Unit

THE C·A·OLSEN MANUFACTURING COMPANY

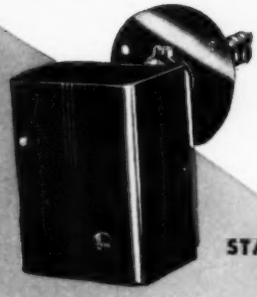
Luxaire HEATING & AIR CONDITIONING UNITS

ELYRIA, OHIO

CONTROLS

that lead the parade!

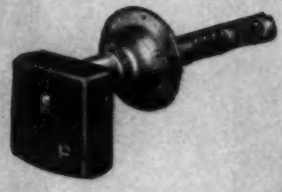
TEMTROL



STACK SWITCH

STOKER TIMER

COMBINATION FAN AND LIMIT CONTROL

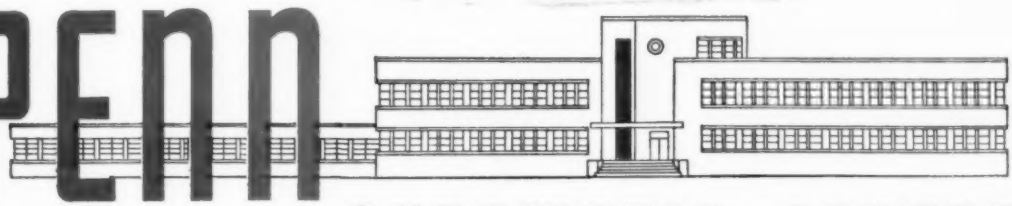


DAY-NITE TEM-CLOCK

• Specify PENN Controls . . . and you can be sure of the best automatic heating controls that can be built. *Yet their extra value involves no extra cost.* They are designed, built and thoroughly tested to assure added efficiency, accuracy and dependability.

PENN's complete line provides a control for every type of heating job . . . every kind of system. It includes PENN Temtrol, the heat-anticipating thermostat which assures true heating comfort by keeping room temperatures extremely close to the selected level. There's PENN Tem-Clock, with its economy and convenience of completely automatic Day-Nite Control.

In addition, this famous line includes the other necessary controls for automatic heating systems . . . primary controls, limit switches and relays. Specify PENN heating controls . . . it's the smart way to insure customer satisfaction. Ask your jobber about them today. Penn Electric Switch Co., Goshen, Ind. Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Penn Controls, Ltd., Toronto, Ont.



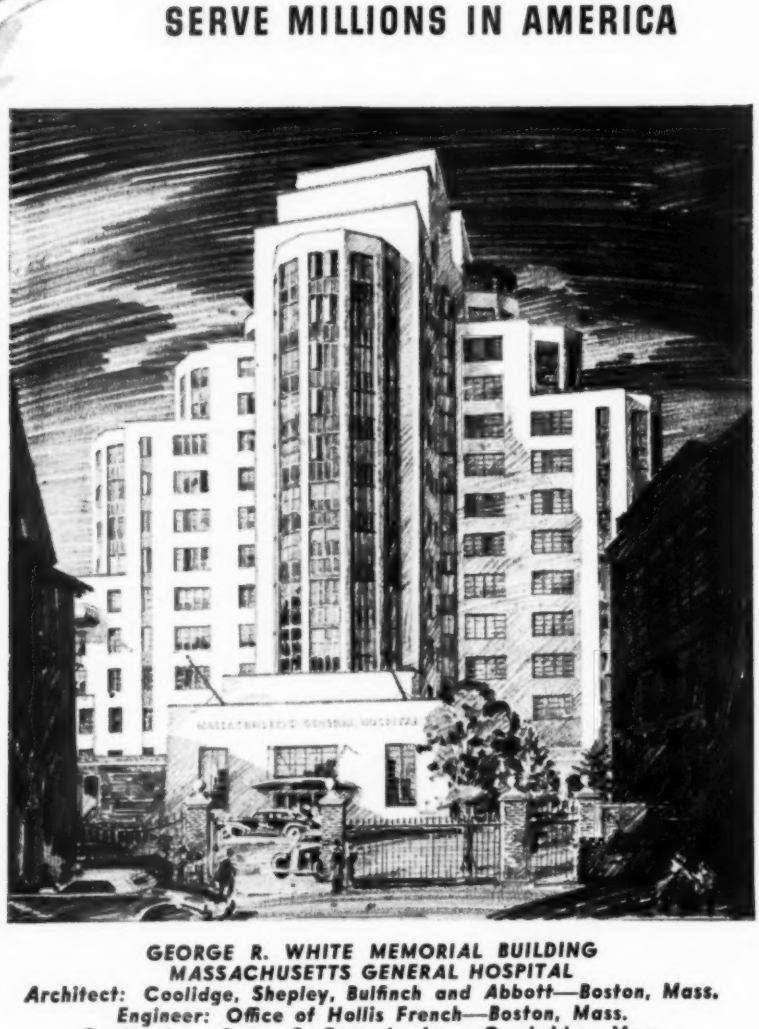
PENN

AUTOMATIC CONTROLS

FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

From the cradle to

HERMAN NELSON PRODUCTS SERVE MILLIONS IN AMERICA



GEORGE R. WHITE MEMORIAL BUILDING
MASSACHUSETTS GENERAL HOSPITAL
Architect: Coolidge, Shepley, Bulfinch and Abbott—Boston, Mass.
Engineer: Office of Hollis French—Boston, Mass.
Contractor: James S. Cassedy, Inc.—Cambridge, Mass.

FROM hospitals where babies first see the light of day . . . to funeral homes from where men go to their final resting place . . . Herman Nelson Products serve millions every day by maintaining comfortable and healthy air conditions.

Because the average man spends about 80 per cent of his entire lifetime indoors, it is important that all buildings in which he goes to school, works and plays be properly heated and ventilated.

For over 40 years, The Herman Nelson Corporation has been building quality heating and ventilating equipment for public, industrial and commercial buildings. Leading Architects, Engineers and Contractors, as well as Owners, know that the use of Herman Nelson Products will assure maintenance of desired air conditions.

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Since 1906 Manufacturers of Quality Heating and Ventilating Products

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GEORGIA
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IOWA
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RHODE ISLAND
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Hajoca Corporation, Richmond, Norfolk, Danville, Roanoke, Staunton.
WASHINGTON
J. C. Bowles Co., Seattle.
WEST VIRGINIA
Trimble & Lutz Supply Co., Wheeling.
The Universal Supply Co., Parkersburg.
WISCONSIN
Cordes Supply Co., Milwaukee.
LaCrosse Plumbing Supply Co., La Crosse.
Murphy Supply Co., Green Bay.
Wisconsin River Supply Co., Wausau.

Herman Nelson Direct Drive Propeller Fans

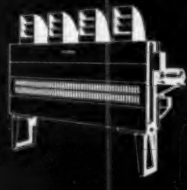
Herman Nelson Belt Drive Propeller Fans

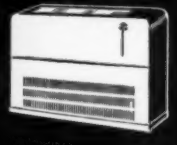
Herman Nelson Horizontal Shaft Propeller-Fan Type Unit Heater

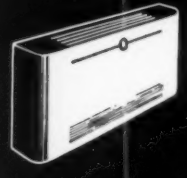
Herman Nelson Type H Centrifugal Fans

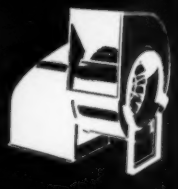
Herman Nelson Vertical Shaft Propeller-Fan Type Unit Heaters

Herman Nelson Type HB Centrifugal Fans


Herman Nelson Blower-Fan Type Unit Heaters


Herman Nelson De Luxe Unit Heaters


Herman Nelson Unit Ventilators


Herman Nelson Belt Drive Unit Blowers

Herman Nelson Direct Drive Unit Blowers

SHEARING

Most grades of ENDURO Stainless Steel can be sheared successfully on the same equipment which you use for mild steel. Shear blades always should be maintained with very close adjustment and with as keen an edge as possible.

FORMING

Use same hand or power brake equipment which you use for ordinary steel. With polished sheets, the application of adhesive tape to the brake dies affords a simple and economical way to protect ENDURO's satin-smooth surfaces.

GRINDING

Three simple precautions: Do NOT use wheels or buffs that are contaminated with other metals. Do NOT use any buffing or greasing compounds containing iron oxide. Do NOT use Turkish Emery as a last finishing operation—*it* may cause discoloration.

WELDING

ENDURO Stainless Steel of the chromium-nickel grades meets practically all welding requirements—is extremely tough and ductile in the as-welded condition. Properly made, a chromium-nickel weld will bend back flat on itself over its own radius without sign of fracture.

These brief timely tips are not intended to serve as a complete guide on stainless steel fabrication. They do, however, give you an idea of the workability of ENDURO and the valuable information contained in Republic's two popular books THE FABRICATION OF REPUBLIC ENDURO STAINLESS STEEL and THE WELDING OF REPUBLIC ENDURO STAINLESS STEEL. If you do not have copies, write for them. They're FREE to sheet metal contractors.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York, 17, N. Y.

...AND THE BEST TIP

ALWAYS USE...

Republic
REPUBLIC STEEL
ENDURO STAINLESS STEEL

Other Republic Products include Black, Galvanized, Galvannealed and Electro Paintlok Sheets—Toncan Iron Sheets

NEW

THATCHER "V" SERIES COMFORTMASTER

OIL FIRED

FULLY AUTOMATIC

COMPARE COMFORTMASTER'S FEATURES

FLANGE MOUNTED OIL BURNER locked in correct relationship to combustion chamber for greatest efficiency and longest life.

TAILOR-MADE COMBUSTION CHAMBER curved to protect steel body from intense heat of oil burner flame. Specially moulded to our own design which guarantees fool proof assembly.

AUTOMATIC VAPORIZING HUMIDIFIER injects dry steam into the warm air to increase comfort and protect health and furnishings. Built of cast iron, with automatic control.

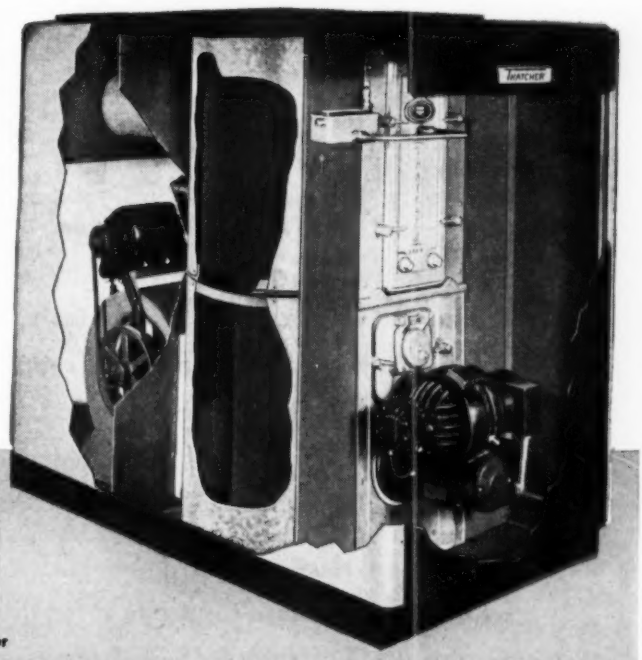
SQUIRREL CAGE TYPE BLOWER specifically designed by Thatcher for the "V" Series Comfortmaster. Casing is Thatcher built . . . all parts highest quality. Whisper silent . . . built to wear and wear.

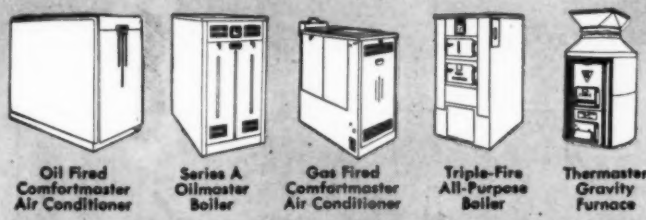
APPROVED TYPE REMOVABLE FILTERS remove dirt and dust from the air . . . lighten dusting chores. Large capacity insures long term protection.

ALL PARTS EASY TO REACH —whether for inspection, cleaning or replacement, they're at your fingertips in a jiffy.

Thatcher's new "V" Series Comfortmaster assures customer satisfaction. It's ruggedly built for life long service . . . more compact than average unit of similar capacity. Each unit is tested and certified before leaving the factory. Years of study and experience by men who have spent their lives designing heaters, stand behind this newest Thatcher product.

For winter air conditioners, or *anything* in the line of heating equipment . . . recommend yourself by recommending Thatcher . . . your warm friend since 1850.





Oil Fired Comfortmaster Air Conditioner | Series A Oilmaster Boiler | Gas Fired Comfortmaster Air Conditioner | Triple-Fire All-Purpose Boiler | Thermaster Gravity Furnace

KEEP YOUR EYE ON THATCHER

Thatcher FURNACE COMPANY

Garwood, New Jersey

SPECIALISTS IN HEATING SINCE 1850

It's easier to do a BETTER job with *COPPER*

WHEN YOU WORK WITH COPPER, you and your customer know you are doing a quality job. You both know that copper will never rust—and that, among all roofing metals, copper has the best reputation for lasting protection. Because it means you're doing the best job possible, there's a lot of satisfaction in working with copper.

It's *easier,* too, because copper is so readily bent, formed and soldered—and possesses adequate strength and toughness for chimney flashings, ridges, valleys, gutters and downspouts.

For anything with a roof on it—from the smallest home to the largest commercial building, it pays to use copper. This durable rustless metal will attest to the quality of your work many years after installation; and sheet metal work of copper assures customer good will.

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from mine to consumer

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THE AMERICAN BRASS COMPANY

General Offices: Waterbury 88, Connecticut

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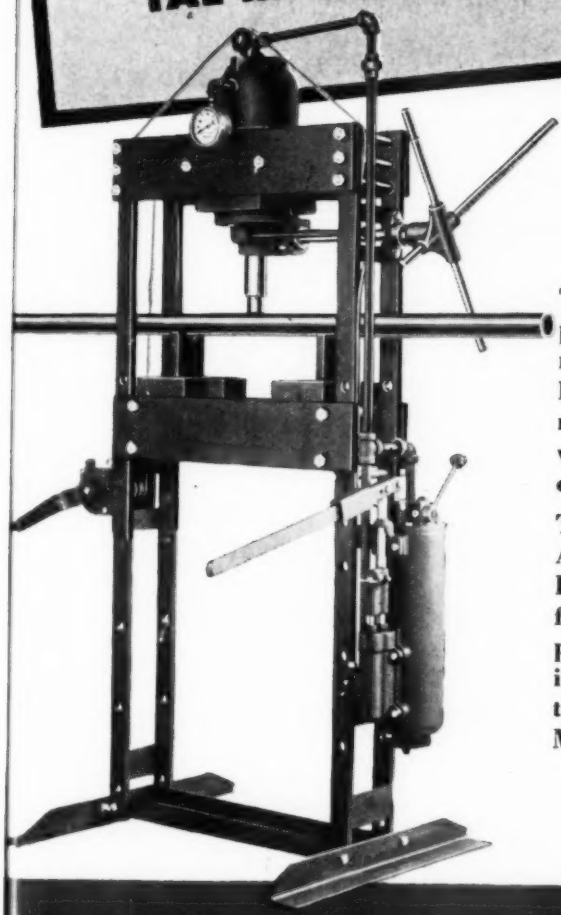
Save time ON PRESSING, BENDING, STRAIGHTENING WITH A KRW HYDRAULIC ARBOR PRESS

INDISPENSABLE IN ANY SHOP ...HANDLES SHORT-RUN PRODUCTION WITH LOW-COST DIES ...AVAILABLE IN 25 TO 75-TON CAPACITIES, EITHER HAND-OPERATED OR MOTOR-DRIVEN, WITH VERTICAL OR HORIZONTAL RAM TRAVEL.

KRW MOTOR-DRIVEN PRESS



KRW HAND-OPERATED PRESS

The old conception of an arbor press is as different from the modern KRW Hydraulic Arbor Press as day is from night . . . now they are built in innumerable shapes, sizes and adaptations to work on hundreds of production jobs other than common straightening, bending and pressing work.

They are available as speedy Hand-Operated Presses; highly flexible Air-Operated Presses or as versatile and effortless Motor-Operated Presses. Then too, they are built in almost any conceivable physical form . . . tall, short, narrow, vertical or horizontal standing, as gap presses, forming brakes and many other designs. Mass production in a modern plant keeps KRW prices at rock bottom and quality at the highest possible peak. Write for the KRW illustrated Press Catalog. Mail the coupon for your copy now.

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K. R. WILSON, 215 MAIN ST., BUFFALO 3, N. Y.

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Name_____

Address_____

Buildings that LAST

Plasteel Roofing and Siding Installation
on building at Port of Tacoma, Washington

Roofing and Siding — your building "cover" — is the deciding factor over the years on —

1. **How long your original building lasts—**
2. **How much it costs you for periodical painting and maintenance—**
3. **How often you have to make costly repairs and replacements.**

That is why in choosing your building "cover" you should choose one that insures *permanency* — that you can apply and forget — not one that requires periodical expense of painting, maintenance and replacements.

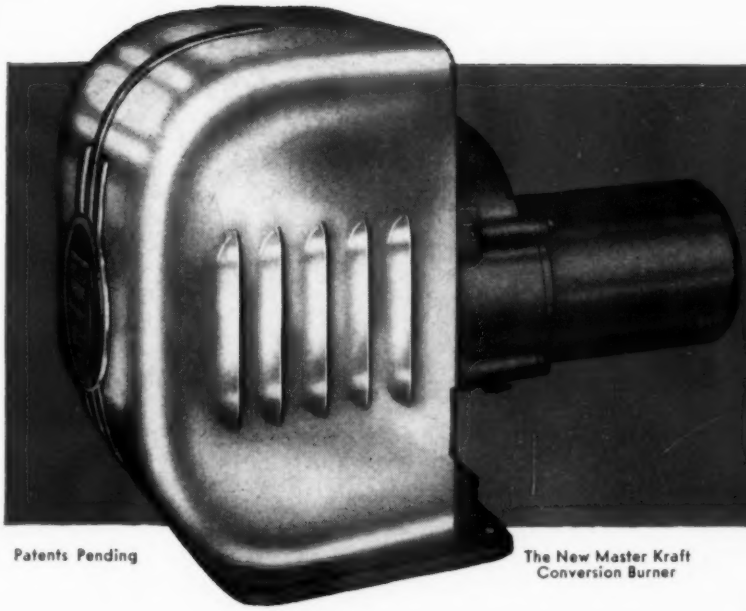
PLASTEEL

the modern Roofing and Siding is steel permanently protected (all over) by a specially developed plastics coating. It resists corrosive atmospheres — rust — salt spray — weather — heat and cold. Never needs painting—lasts indefinitely — and gives your building a pleasing appearance. Choose permanency — choose PLASTEEL.

Write or Wire for Complete Information Today. A Few Choice Territories Still Available for Representation.

PLASTEEL PRODUCTS CO.

General Office and Plant • Washington, Pennsylvania



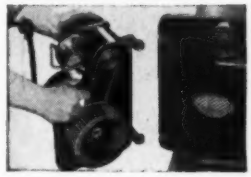
YOU CAN SERVICE THIS NEW BURNER IN 2 MINUTES

Patents Pending

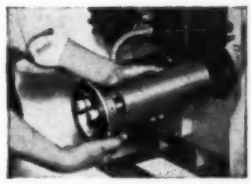
The New Master Kraft Conversion Burner

Change the pump—motor or transformer in 2 minutes — remove the combustion head in 1 minute and 30 seconds. *That's real Quick-Change!* No need to spend hours in your customer's basement — do the repair work in your own shop. Eliminate the time element and guesswork on service calls.

This marvelous new burner will be ready to roll off our production lines *as soon as materials are available.*



Pull two pins and remove the service unit, replace it with a new one. The *entire quick-change takes only two minutes!*

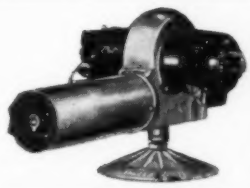


The entire combustion head may be quickly withdrawn for inspection or servicing in *one minute and thirty seconds.*

The transformer can be replaced with a *new one in two minutes* with this QUICK, EASY, SIMPLIFIED SERVICE.

Meantime

we are continuing to manufacture our popular pre-war type of burner, the well-known Master Kraft — Models T thru M2 (Model K shown at right).



Master Kraft

OIL HEAT

HARVEY-WHIPPLE, INC.

SPRINGFIELD 1 MASSACHUSETTS

Harvey-Whipple, Inc.
Dept. AA-5
Springfield, Mass.

Gentlemen:

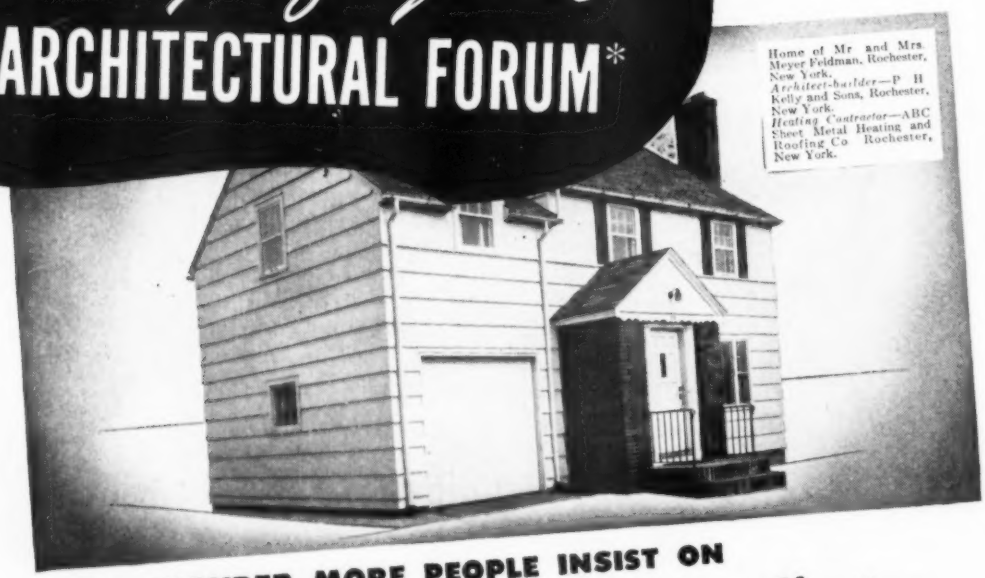
Please send me details on a MASTER KRAFT Franchise.

Name .....

Street ..... State .....

City .....

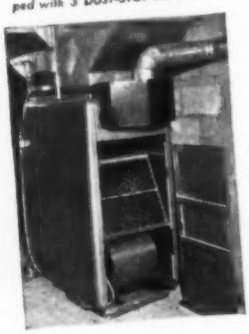
We say it for you in ARCHITECTURAL FORUM*



Home of Mr. and Mrs. Meyer Feldman, Rochester, New York.
Architect-builder—P. H. Kelly and Sons, Rochester, New York.
Heating Contractor—ABC Sheet Metal Heating and Roofing Co. Rochester, New York.

NO WONDER MORE PEOPLE INSIST ON *Warm-Air Heating*

Mor-Sun Model T-6-G gas-fired furnace, made by Morrison Steel Products, Inc., Buffalo, N. Y. Equipped with 3 DUST-STOP Air Filters.



•Homeowners and potential owners, by the thousands, have expressed their preference for warm-air heating in several recent surveys. They know the "extra" values it gives in comfort, convenience and economy

More people are insisting on today's winter-air-conditioning systems because of this exclusive combination of values:

1. **WARM AIR,** with room temperatures quickly responding to automatic controls.
2. **CLEAN AIR.** Filtered at the heating unit, all heat delivered throughout the warm-air duct system is free of nuisance dusts, lint and most air-borne bacteria. Housekeeping burdens are lighter because walls and furnishings stay clean longer.
3. **MECHANICALLY-CIRCULATED AIR** keeps warm air fresh and clean while providing the proper number of air changes per hour.
4. **HUMIDIFIED AIR** affords greater physical comfort at lower room temperatures.

Architects, builders and contractors who specify and provide modern warm-air heat know that circulating air will be cleaned efficiently. For DUST-STOP* Filters, a Fiberglas** product, are the choice of most manufacturers as original equipment. They're the homeowner's choice, too, for replacement DUST-STOPS are readily available at low cost through suppliers in every community.

For complete information see Sweet's Files or write: Owens-Corning Fiberglas Corporation, Dept. 930 Toledo 1, O. Branches in principal cities.

In Canada: Fiberglas Canada Ltd., Toronto 1, Ontario.

OWENS-CORNING FIBERGLAS

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

*T. M. Reg. U. S. Pat. Off.
**Fiberglas is the trade name (Reg. U. S. Pat. Off.) of a variety of products made of or with glass fibers by Owens-Corning Fiberglas Corporation.

*Over 50,000 key men who influence millions of buying decisions on your products, will be reached by this advertisement in Architectural Forum.

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"Your partner whose Actions speak louder than words"

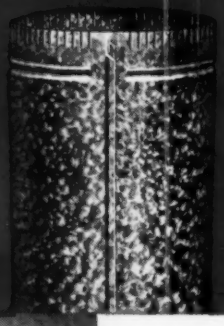
Wheeling
CORRUGATING COMPANY
Reg. U.S. Pat. Off.

MAKES A GOOD JOB BETTER!

COP-R-LOY GALVANIZED SHEETS

CONDUCTOR PIPE

ROOF GUTTERS



FURNACE PIPE

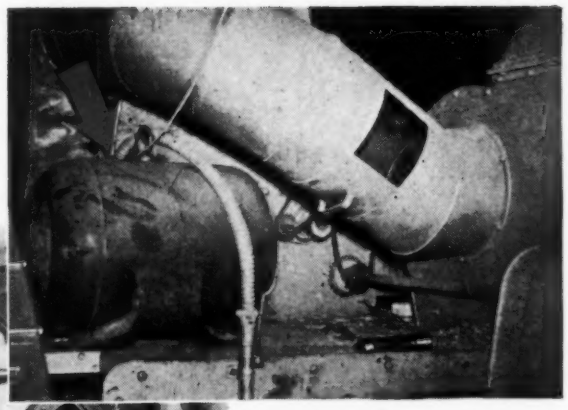
EAVES TROUGH

COP-R-LOY GALVANIZED ROOFINGS

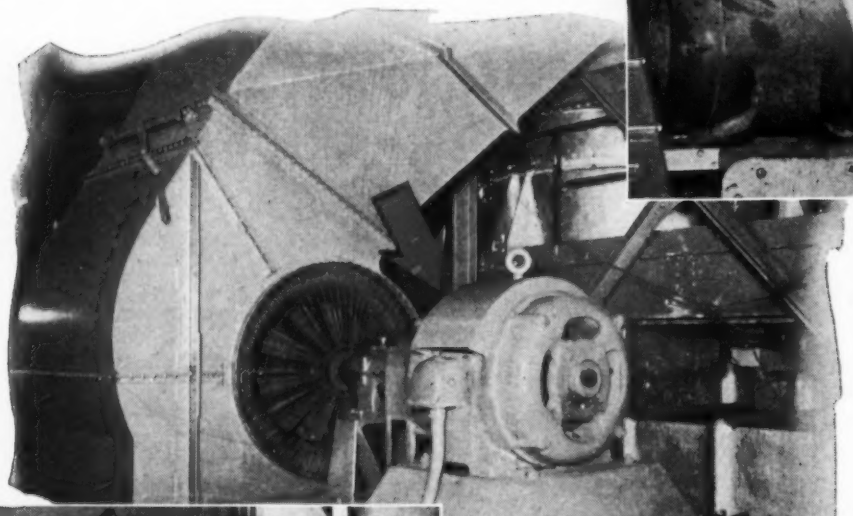
WHEELING CORRUGATING COMPANY • WHEELING, W. VA.

ATLANTA BOSTON BUFFALO CHICAGO CLEVELAND COLUMBUS DETROIT KANSAS CITY
LOUISVILLE MINNEAPOLIS NEW ORLEANS NEW YORK PHILADELPHIA PITTSBURGH RICHMOND ST. LOUIS

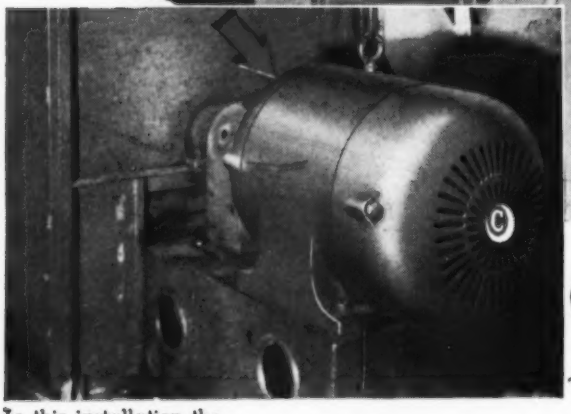
You Can Forget About Atmospheric Hazards



This 5 horsepower Century motor operates a conveyor in a grain elevator in an atmosphere charged with explosive dust.



Because this Century 200 horsepower motor operates a blower in the boiler house of a large generating plant it is *protected from falling objects* and dripping liquids.



In this installation the 15 horsepower Century motor is *totally enclosed fan cooled* because it operates in an atmosphere charged with corrosive fumes that would attack the vital parts of the motor.

When You Have a CENTURY Protected Motor ...Properly Applied

WITH the correct Century motor driving your machine you can have complete confidence that it will provide a long life of satisfactory performance.

From the wide range of standard types and sizes there is a Century motor that will meet the electrical characteristics and atmospheric conditions of nearly every application.

The three examples shown here each require a different kind of motor frame because of the differences in surrounding conditions. In addition to the fact that all three are powered by Century motors — they have other things in common. They are quiet starting, and they run smoothly and quietly due to their unusual freedom from vibration. They have the correct electrical characteristics to give top performance.

Century builds a complete line of electric motors and generators, fractional and integral horsepower, in the popular sizes to meet the requirements of appliances, industrial production and commercial needs.

Specify Century for all your electric power applications.

Century C MOTORS

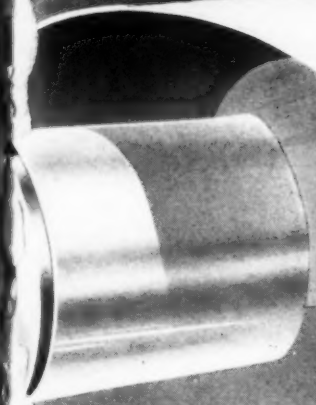
CENTURY ELECTRIC COMPANY • 1806 Pine Street • St. Louis 3, Missouri

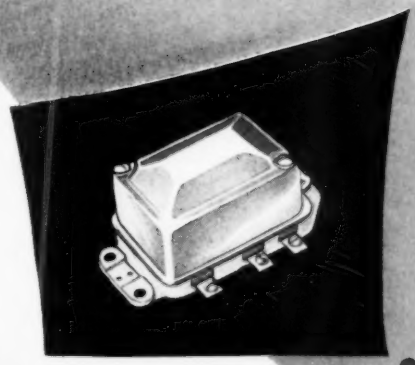
Offices and Stock Points in Principal Cities

520

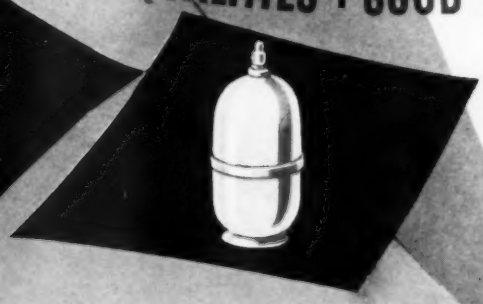
WEIRTON

COLD-ROLLED STRIP





EXCELLENT DRAWING QUALITIES + GOOD FORMABILITY = VOLUME PRODUCTION



The use of Weirton cold-rolled strip steel can be a big factor in maintaining high volume at low cost in the making of countless articles or parts. Production is speeded because Weirton strip possesses exceptional drawing and forming qualities. Costs are cut because spoilage and scrap losses and tool expense are reduced. In short, use Weirton cold-rolled strip to promote plant efficiency.

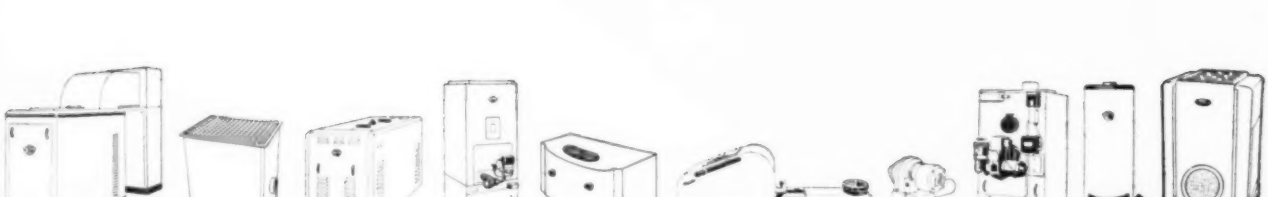
Also produced in WEIRZIN Electrolytic Zinc-Coated Cold-Rolled Strip

WEIRTON STEEL CO.

WEIRTON, W. VA. *Sales Offices in Principal Cities*

Division of **NATIONAL STEEL CORPORATION** *Executive Offices, Pittsburgh, Pa.*

a better name
for a superior product



Trade Mark Reg.

All of Viking's Automatic Heating, Cooling and Commercial Refrigeration products reflect the great technical and production advances made during the war. These new products will now be trade-marked VIKIMATIC — and every unit will be identified by the handsome new name-plate, here illustrated.

Appropriately linking the words "Viking" and "Automatic", the new name (Trade-Mark, Reg.) and the new insignia will be featured in Viking's consumer and trade advertising, sales literature, display and dealer-aid material. And VIKIMATIC's nation-wide organization of Distributors and Contractor-Dealers will benefit from this distinctive and more descriptive identification of the superior equipment they are authorized to represent.

THE VIKING MFG. CORPORATION

1747 Chester Avenue **Cleveland 14, Ohio**

ACTUATED BY LIGHT

MERCOID
VISAFLAME

The most advanced Safety Control System for domestic and industrial Oil Burners

Complete information in bulletin No. V-9

THE MERCOID CORPORATION • 4201 BELMONT AVE., CHICAGO, ILL.

Manufacturers of dependable automatic controls for a quarter of a century

For a one-family home or a towering apartment . . .

it pays to install Petro!

Both the home owner and the apartment operator have the same idea about heating. Both want low-cost operation, freedom from furnace chores, and the convenience and comfort which fine oil burner performance assures.

When you sell Petro you can deliver what the buyer wants and know your installation will deliver an operating performance that will add to your reputation. Your Petro line includes pressure atomizing models and sizes from 1 to 18 gallons per hour for homes and small commercial jobs, and industrial rotary cup burners burning up to 145 g.p.h. of #5 or #6 oil.

Petro burners, water heaters and boiler-(or furnaces-) burner units are distributed by heating wholesalers. Write for address of nearest supplier.

PETRO

REG. U.S. PAT. OFF.

MAKERS OF GOOD OIL BURNING EQUIPMENT SINCE 1903

PETROLEUM HEAT AND POWER COMPANY · STAMFORD, CONNECTICU

PETRO FUEL OIL BULK PLANTS, DISTRIBUTION TERMINALS AND FACILITIES IN: BOSTON · PROVIDENCE · STAMFOR
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WEBSTER ELECTRIC

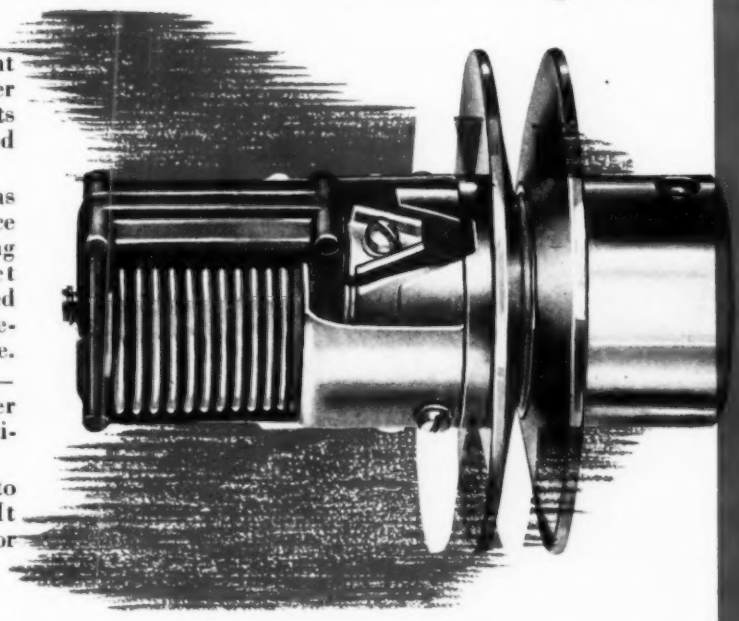
Thermodrive Meets Public Demand for Better Heat Circulation, More Even Room Temperature

Thermodrive is the latest refinement in home heating. It makes any blower a variable-speed blower, correlating its speed continuously with heat generated in the furnace.

The blower "cuts in" at slow speed as soon as the bonnet begins to produce usable heat at the start of the heating cycle (about 90°). As the bonnet temperature increases, blower speed increases in exact ratio, similarly decreasing its speed on the "off" cycle.

Results are better heat circulation—longer blower operation with lower average blower speed—reducing stratification to the minimum.

Thermodrive is ruggedly built, easy to install, positive in its operation. It can be applied to new equipment or old. Write for full information.



Years of Dependable Service Have Proved the Merit of Using These Webster Electric Products

★ Fuel Units

The "Know-How" gained in manufacturing hundreds of thousands of fuel units is behind the quality construction available today. This is evidenced by a long record of successful performance. Trouble-free, their performance proves you can buy them with confidence. Easily serviced—quiet running—simple mounting features and quick cut-off.

In Canada, made by Canadian Acme Screw and Gear, Ltd., Toronto, Canada.

Transformers ★

Webster Electric Ignition Transformers are known for dependable instant starting. They are built in three sizes for universal adaptability and constructed with highest quality materials. Mica insulated core laminations are nonaging, high silicon content, special transformer grade stock. Secondary coils—wound to exacting standards, balanced and matched for weight, size, resistance and inductance. Convenient primary connections.

WEBSTER ELECTRIC

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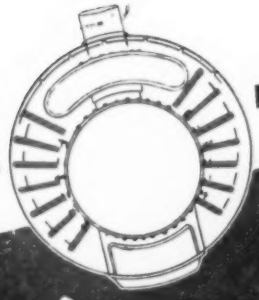
"Where Quality is a Responsibility and Fair Dealing an Obligation"

FINS GIVE MORE HEAT



Why Dealers Who Sell

VICTORS

LIKE HEAT RADIATING FINS

HEATING SURFACES

Ordinary cast iron.

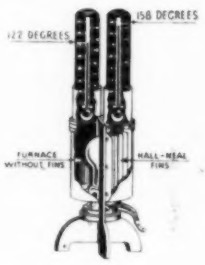
Ordinary steel.

VICTOR.

Dealers like them because the exclusive, patented VICTOR FINS make sales fast *and* the satisfied customers stay satisfied. Satisfied VICTOR owners are the best "sales-getters" VICTOR dealers have. The additional metal heating surface provided by VICTOR FINS generates more heat from the same amount of fuel. Once this is proved to the prospect your order is practically signed. Quality since 1890 plus FINS—sells more furnaces.

TABLE TOP DEMONSTRATOR

The Victor Table Top Demonstrator dramatically and honestly proves to your prospect, on a table or desk, the increased efficiency provided by VICTOR FINS—It closes sales FAST!



Dealers Write Now!

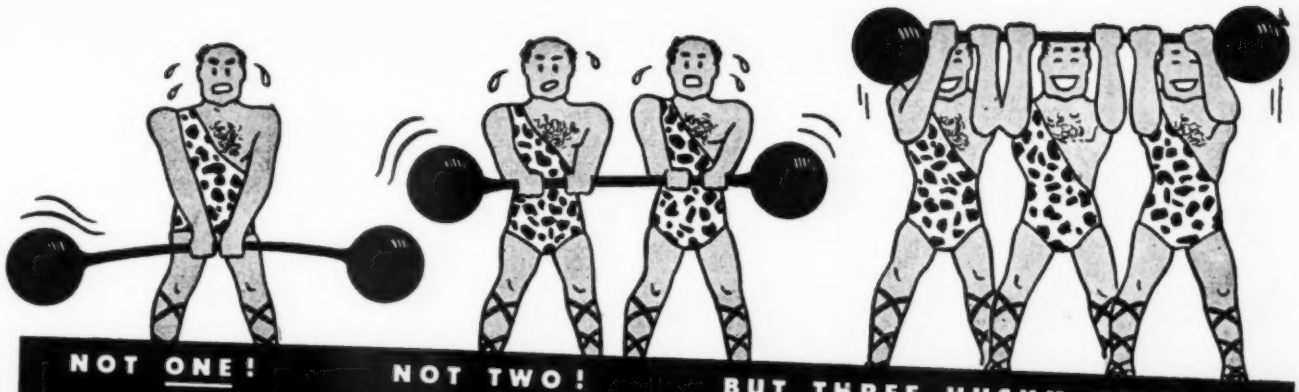
Investigate the VICTOR OIL-GAS and COAL furnace line NOW. Increased production is permitting us to add some new accounts. Our proposition to you is interesting.

FURNACES — STOKERS — OIL BURNERS — GAS BURNERS — BLOWERS —ACCESSORIES

HALL-NEAL FURNACE CO.

VICTOR *Quality Furnaces Since 1890*

1322 N. CAPITOL AVENUE · INDIANAPOLIS 7, INDIANA



NOT ONE! NOT TWO! BUT THREE HUSKY HELPERS

To Boost Silent Breeze Profits for You!

"BIG SPACE" NATIONAL ADVERTISING

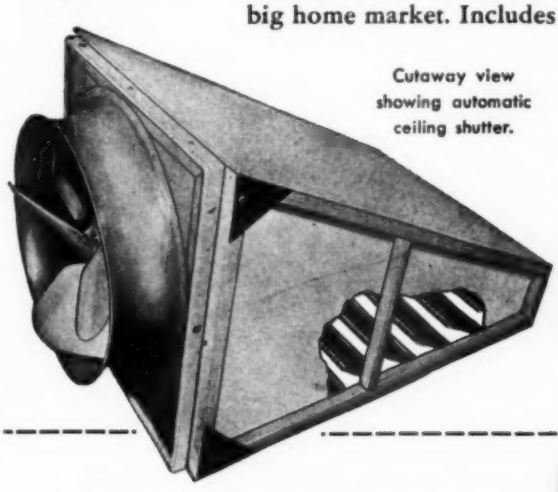
Reaching regularly into more than 6,725,000 homes with compelling half and quarter-pages in *The Saturday Evening Post* and *Better Homes and Gardens.* Building ever-greater acceptance among 54,882 dealers, distributors and others in the trade with full, half and three-quarter pages in leading trade publications.

POWERFUL PROFIT PROMOTION FOR DEALERS

Helping you take advantage of the richest ventilating fan market on record with a big, new newspaper campaign for local use . . . point-of-sale displays . . . folders, leaflets, envelope stuffers . . . scripts for local radio commercials . . . and many others. Plus *free,* 48-page Selection and Installation Manual for the guidance of *Silent Breeze* dealers in making every home, commercial or industrial installation a success.

A PRODUCT COMPLETELY "PACKAGED" FOR EASY INSTALLATION

A *Silent Breeze* "first"—a "natural" for the big home market. Includes *all* the fan sizes and automatic accessories you need for any residential installation:



Cutaway view showing automatic ceiling shutter.

SILENT BREEZE FAN—Modernly designed and ruggedly built. Whisper-quiet and economical in operation.

SUCTION CHAMBER—Provides a leakproof, sound-absorbing enclosure between fan and shutter or grille. Prefabricated in four panels for easy assembly.

COMFORTROL—Precision time switch for completely automatic fan operation.

AUTOMATIC CEILING SHUTTER—Opens when fan comes on, closes when it is shut off. Latest flush-type design.
(Automatic outlet shutter available for sidewall installation when suction chamber is not used.)

Put These Three Big Profit-Makers to Work for You Now!

Write

HOLCOMB & HOKE MFG. CO., INC.

1543 VAN BUREN ST., INDIANAPOLIS 7, IND.

Silent Breeze
VENTILATING FANS
VENTILATION PLUS COOLING WITH AIR IN MOTION

CONCO

Means

IMMEDIATE STOKER SALES!

Coal, the nation's *number one fuel* is once again plentiful! CONCO distributors and dealers will reap rich profit immediately through ever-increasing stoker sales.

Domestic sizes of prepared stoker coal, in particular, have been in short supply during the past several years. Clean, economical, especially treated stoker coal is available now the nation over to provide healthful, dependable, even heat.

Coal, America's basic, long-range fuel plus the customer-pleasing, trouble-free CONCO automatic coal stokers make an outstanding sales and profit team for CONCO distributors and dealers.

Take advantage of this opportunity *today*— write for complete franchise details.

CONCO *heat*

CONCO ENGINEERING WORKS

MENDOTA, ILLINOIS

NEW HOMES—OLD HOMES

need heating devices equipped with the revolutionary new "DETROIT" Float Valve

CRC 246

ADVANCED IN PRINCIPLE

SIMPLER IN DESIGN

IMPROVED IN APPEARANCE

SUPERIOR IN PERFORMANCE

All the thousands of homes which want improved heating are potential markets for space heaters, water heaters, ranges, furnaces, stoves, equipped with this revolutionary new "Detroit" Float Valve. The CRC 246 is a far superior valve.

Some of its features are:

Connects directly to burner nipple. Eliminates tee, fittings, and tubing.

Due to the position of the metering stem, approximately in the center of the assembly, this valve can be tilted a reasonable amount without affecting fuel flow. Leveling by eye is satisfactory. This saves time at assembly and minimizes service calls.

Rate of flow to burner is constant with inlet heads varying from 2 inches to 84 inches. Permits placing bottom of tank flush with top of valve and assures maximum heater output as long as there is fuel in tank. Makes possible design of heaters of less overall height or greater tank capacity. Eliminates "dying fire" when fuel supply is low.

Safety mechanism trips from level of fuel in burner as well as level in valve. Results in less pooling of fuel in burner if fire is extinguished.

Magnetic trip mechanism is positive. Will not trip from vibration.

Low flows are extremely accurate and consistent—a decided advantage for low pilots on water heaters and furnaces. Variations in viscosity have little affect on fuel flow.

Fully temperature-compensated. Uniform fuel flow regardless of temperature assures full heater output at all times.

Smaller size—neat appearance—only two-thirds the size of present valves. Provides greater flexibility in heater design.

Simple to service. Few parts to handle—job takes only a few minutes.

2522

DETROIT LUBRICATOR COMPANY *General Offices:* 5900 TRUMBULL AVENUE DETROIT 8, MICHIGAN

Division of AMERICAN RADIATOR & Standard Sanitary CORPORATION

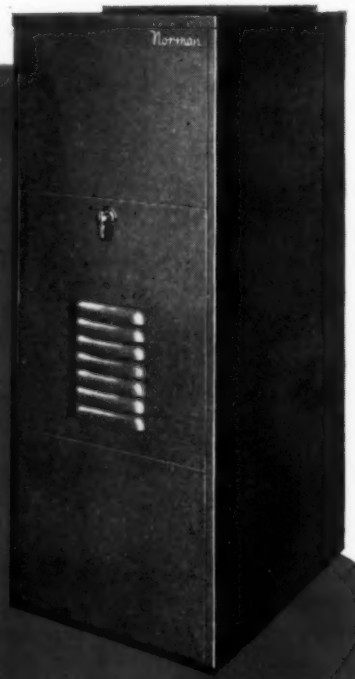
Canadian Representatives—RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

"DETROIT"

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

FOR TODAY'S BIG MARKET

Norman 70 winter air conditioner



Norman "70" Standard
Width 21½", Depth 23½"
Height 35"

DESIGNED FOR THE SMALL HOME PRICED FOR THE SMALL G. I. BUDGET

A COMPACT UNIT FOR UTILITY ROOMS AND HOMES WITHOUT BASEMENTS

DEALERS! DISTRIBUTORS!

A few choice distributor territories and dealerships are still open.

WRITE FOR THIS FOLDER!

Send for this free folder describing the new Norman "70".

Here's the Winter Air Conditioner that's made to the measure of your biggest market today. The new Norman "70" is smaller, more compact — yet has an input of 70,000 BTU per hour. Fits in any corner of any small room because there are four different possible locations for the cold air return — rear, bottom or either side. Handles any type of gas including LP. Rich green baked-on enamel finish fits into any decorative scheme. It features the Norman improved principle of burning gas. And it's priced to fit today's small home budget.

E. A. NORMAN, JR., PRES. D. D. PIPER, EXEC. V. P. in Charge of Sales

Norman PRODUCTS COMPANY

1150 CHESAPEAKE AVE. COLUMBUS 8, OHIO

ONE WAY TO BE SURE OF

WRENCH *Quality*

* "CRESCENT" is our trade mark registered in the United States and foreign countries for wrenches and other tools. "Crescent" tools are made only by Crescent Tool Company of Jamestown, N. Y., and are sold by leading distributors everywhere.

FOUR FEDERATED *firsts*

THAT GIVE YOU SOLDER SATISFACTION

1 *first in* PRODUCT VARIETY

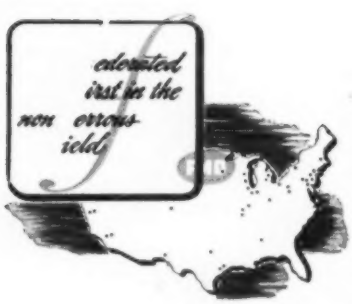
Solders for every purpose . . . rosin-core, acid-core, solid wire; pig, bar, wiping, body, ribbon, segment . . . in every commercial or special form and grade — you get them all from one source, first in the field — Federated Metals Division.

2 *first in* UNIFORMITY

Federated solders . . . made with strict lab control to meet Federated's nationally known specifications . . . are uniform in the analyses you need to produce quality workmanship.

3 *first in* TECHNICAL SERVICE

50 years' metallurgical experience, modern laboratory practice, and real solder know-how . . . interpreted by practical service engineers to keep you informed of latest developments.



4 *first in* FACILITIES

Federated has 11 strategically located plants and 25 sales offices — all the facilities that make it easy for you to deal with an organization in your own area. Deliveries are faster, and there is always a friendly Federated office within easy telephone radius.

When you buy or specify solder, be sure you get the best . . . with the helpful experience of the first in the field. For quality solder, and service that helps you in your work, call or write the Federated office nearest you. *Federated Metals Division, American Smelting and Refining Company, 120 Broadway, New York 5, New York.*

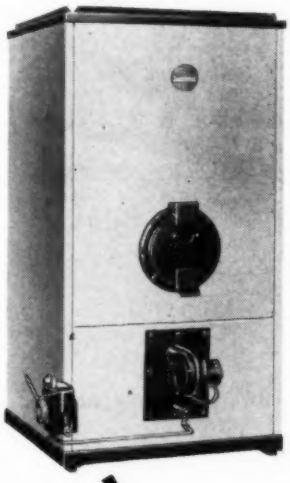
JML COF-535

Federated METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY

MEET THE *DEMAND* FOR OIL HEAT

with MONCRIEF'S *new 1947 line*



Revolutionary achievements in design—construction—operation—installation—inspection and servicing—of Moncrief's new 1947 line of oil fired heating equipment are creating a sensation in the oil fired heating business.

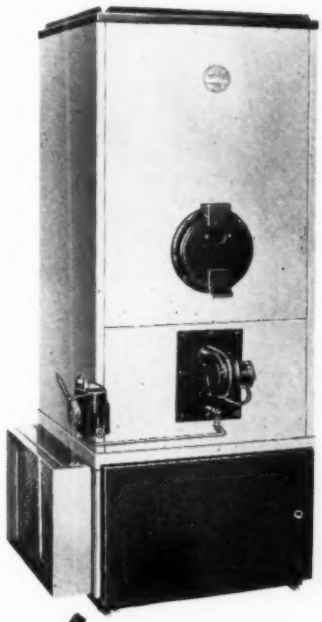
New cabinets with tight fitting floors that eliminate basement platforms or grouting . . . durable, steel heating elements with automatic, submerged arc welded seams . . . radiation shield that replaces noisy inner liners . . . are all new distinctive features.

Series "O" models are designed so that almost any standard, gun type burner can be installed easily in the large, roomy vestibule. The radiator of tubular construction which can be readily cleaned inside and out by simply removing a single plate, is also an outstanding advantage.

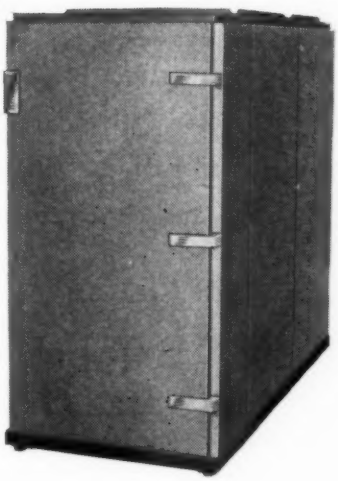
Vaporizing units have forced draft combustion . . . fuel line cleaning device . . . flame deflector of stainless steel . . . *and an outstanding engineering development*—**an oil burner that is easily installed or removed as a *complete unit* without dismantling the combustion chamber or cabinets!**

These new and outstanding features make Moncrief "TOPS" in oil fired heating equipment.

Write for complete details.



Series VW
Oil Fired, Steel
Gravity Unit



Series P
Oil Fired, Steel
Air Conditioning
Unit

Series VU
Oil Fired, Steel
Utility Air Conditioning Unit

Series VL
Oil Fired, Steel
Air Conditioning
Unit

THE HENRY FURNACE COMPANY • *Medina, Ohio*

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

When SPEED Counts

No time is wasted on the job in cutting and trimming to fit when C&L Lamneck furnace pipe and fittings are used. Each job is completed easier and faster, which means reduced installation time and expense resulting in greater profit.

In order to meet extremely heavy demands some items are being made of aluminum.

Specify dependable prefabricated C&L Lamneck furnace pipe and fittings when ordering from your jobber.

Other C & L Products: C&L BLOW TORCHES, FIRE POTS; C&L HOFFMAN WATER HEATERS; C&L MONARCH BUILDERS FINISH HARDWARE; BUCKEYE GRAIN BINS, CORN CRIBS; SILVER SHIELD SILOS.

C&L Lamneck TRADE MARK

FURNACE PIPE AND FITTINGS

CLAYTON & LAMBERT MFG. CO.

Sales Office: 1760 **DIXIE HIGHWAY, LOUISVILLE 10, KY.** • ***Factory:*** **MIDDLETOWN OHIO**

MOR-SUN'S PROMOTIONAL 7 Keys

mean MORE PROFITABLE BUSINESS for you!

1. ATTRIBUTES of a SALESMAN . . .

The pocket-size book that's received praise in national advertising and trade publications . . . used widely by colleges and trade schools . . . and by other industries.

2. SALESMANUAL for Merchandisers of Warm Air Furnaces . . .

To help you and your salesmen sell more warm-air furnaces—this folder presents the how, when, where and what (also nationally acclaimed by selling organizations).

3. The STORY of MORRISON . . .

To inform you of the important sales-making features of the Morrison plant and products, this booklet sums up the story for you and your salespeople.

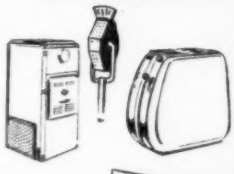
4. Dealer and Consumer Bulletins

T-Series Oil Furnaces
U-Series Oil Furnaces
T-Series Gas Furnaces
U-Series Gas Furnaces

Dealer and consumer literature that dramatizes the beauty and service of the MOR-SUN line . . . complete specification bulletins as well as effective mailing pieces.

5. WALLSPREAD and DECALCOMANIA . . .

Give your walls and windows color with the large wall spread of the new MOR-SUN line and the attention-arresting colorful decalcomania.



6. NEWSPAPER AD MATS and RADIO SCRIPTS . . .

Run MOR-SUN advertising under your own name . . . FREE mats and radio scripts you'll be proud to call your own. It pays to advertise—right!

7. NATIONAL ADVERTISING IN LEADING ARCHITECTURAL and BUILDING MAGAZINES . . .

Every architect and builder in the country reads our informative, sales-making ads in his own particular trade paper. We promote to him—we pre-sell him—to help you close the sale!

And other Keys will continually be added to your MOR-SUN Key Ring!

"The Sun Never Sets with MOR-SUN!"

MOR-SUN'S policy is to give you a product as well as a plan--the MOR-SUN line of pressed steel furnaces . . . plus a planned promotional program to help you sell more--to mean better business, more profitable business for you!

MOR-SUN'S representative in your territory is ready, willing and able to show you how to make this program mean more business! If he hasn't called on you yet, write us for his name and address.

MOR-SUN STEEL FURNACES

MORRISON STEEL PRODUCTS, Inc. BUFFALO 7, N. Y.

The *tireless twins* assure *effortless* heating safety

700 STEAM

705 WARM AIR

500 HOT WATER

Carefree is the man to whom you
automatic heating operated by the Tire
Twins. For automatic heating
the only modern home equipment tha
completely safe and free from physical eff

Twin Contact Controls, symbolized by the Tire
Twins, safeguard the home 'round the clock
no chance of "runaway" fires or dangerous overheat
— even if power fails.

Wherever the finest in heating equipment is instal
you'll find Twin Contact Controls perform
safely, dependably, effortlessly — proof that lead
heating manufacturers are right in pre-selecting them
bear their trade mark names.

OUTSTANDING LIMIT CONTROL FEATURES

WARM AIR • Twin Contact Switch • Easy independent adjustment of "off" and "on" pointers • Temperature settings made without removing cover.

HOT WATER • Twin Contact Switch • Strap-on or immersion types of equal sensitivity • Simple, dependable, *Fail-Safe* design.

STEAM • Twin Contact Switch • Expanded scales and external finger tip adjustments • Spring Hinge Construction for greater accuracy and dependability.

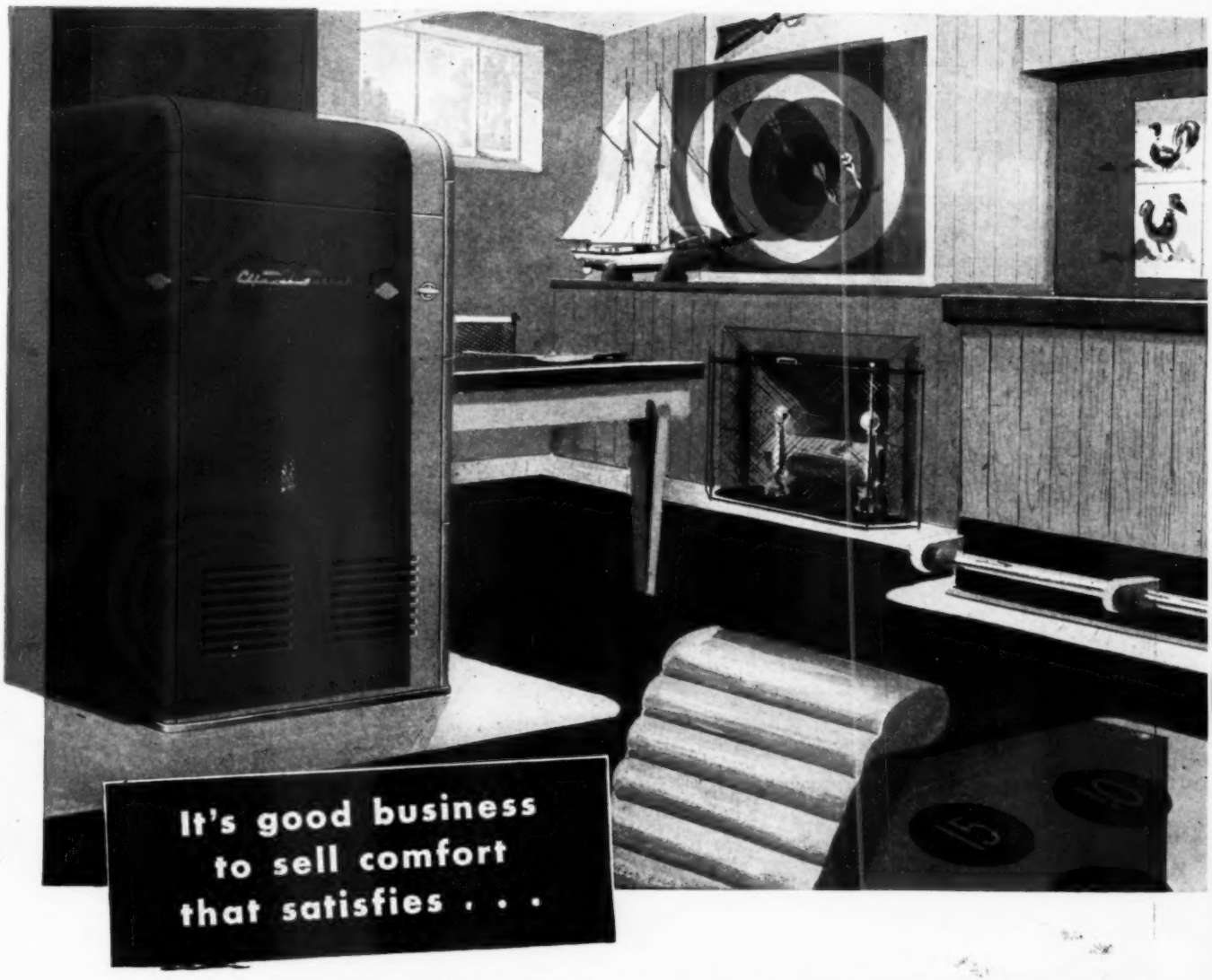
PERFEX CORPORATION, MILWAUKEE 7, WIS. • Perfex Controls Ltd., Toronto

PERFEX

TWIN CONTACT CONTROLS

MANUFACTURERS OF AUTOMATIC CONTROLS BEARING THE TRADE MARK NAME
OF LEADING PRODUCERS OF AUTOMATIC HEATING SYSTEMS AND APPLIANCES

EFFORTLESS AUTOMATIC HEAT . . . DOES THE JOB COMP



and satisfaction is certain with Mueller Climatrol

The True Indoor Comfort of "climate control" is a lasting pleasure your customers appreciate for years to come . . .

Yes — Climatrol's *True Indoor Comfort* pays annual dividends of good-will from satisfied customers — a valuable asset for your business future.

As a Climatrol Comfort Merchant, you can expect a good share of the expanding modernization and new-building market in your area. The complete Mueller Climatrol line enables you to supply the right size and type for every requirement — each model specially engineered for efficiency with a specific fuel — gas, oil, or coal. Climatrol's smart, new styling is just what today's homeowners want for their modern basements.

Your selling effort is supported by Mueller's strong national advertising campaign — every installation you make is backed by Mueller's 90-year performance record. More and more home-owners choose "climate-control" for True Indoor Comfort — that's why it pays to sell Climatrol!

Write for bulletins.

L. J. Mueller Furnace Co.

2010 West Oklahoma Avenue • Milwaukee 7, Wisconsin

MEMBER INDOOR COMFORT

MUELLER Climatrol

Reg. U. S. Pat. Off.

D-73

How to beat the rust problem —at LOW COST

There is more than one answer to the problem of corrosion in ductwork. But considering cost of materials and their workability, there is a practical solution in the use of a rust-defying, copper-bearing galvanized sheet steel like Beth-Cu-Loy.

Beth-Cu-Loy Sheets offer a double defense against rust. Beth-Cu-Loy is protected on the surface by Prime Western zinc applied in a tight, bright coating. Under the coating is the Beth-Cu-Loy base containing 0.20 to 0.30 percent copper, with 2 to 2½ times the rust-resistance of ordinary steel. Result: if rust eventually penetrates the zinc coating, it comes up against a barrier of copper-bearing steel.

Beth-Cu-Loy sheets have the easy-forming qualities that sheet-metal men like, yet they have adequate stiffness to permit the use of long sections in ductwork. They are simple to cut, to seam and to solder. With all of these advantages, Beth-Cu-Loy Galvanized Sheets cost very little more than ordinary zinc-coated steel sheets.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

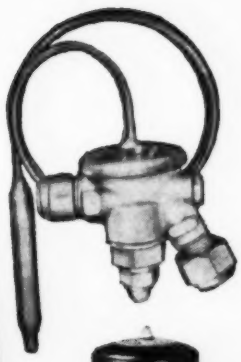
On the Pacific Coast Bethlehem Products are sold by Bethlehem Pacific Coast Steel Corporation

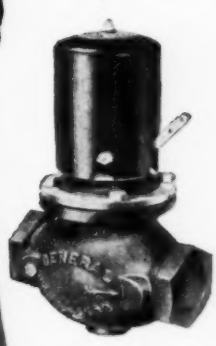
Beth-Cu-Loy Galvanized Sheets

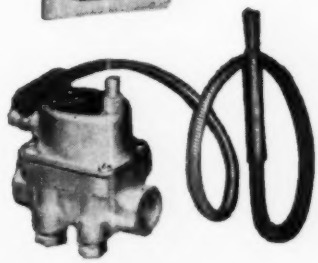
BETHLEHEM STEEL

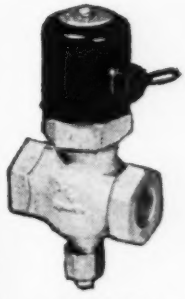
GENERAL CONTROLS . . .

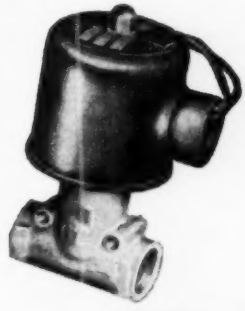
THE ACKNOWLEDGED STANDARD IN AUTOMATIC PRESSURE, TEMPERATURE AND FLOW CONTROL UNITS

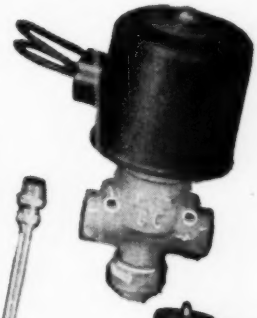


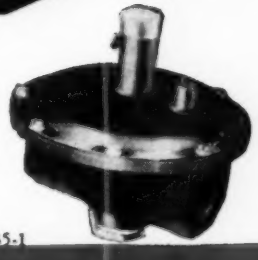












Here are a few of an outstanding line of controls for Industrial, Commercial and Domestic applications.

- ★ALL-GAS CONTROLS
- ★AIRCRAFT CONTROLS, ELECTRIC
- ★AUTOMATIC SAFETY PILOTS
- ★GAS REGULATORS
- ★LOW WATER CONTROLS
- ★GOVERNOR TYPE VALVES
- ★HI-LOW-OFF VALVES
- ★INDUSTRIAL VALVES
- ★LOW PRESSURE GAS VALVES
- ★MOTOR OPERATED VALVES
- ★MAGNETIC GAS VALVES
- ★PILOT BURNERS
- ★PILOT GENERATORS
- ★REFRIGERATION VALVES
- ★SOLENOID VALVES
- ★STRAINERS—RELAYS
- ★100% SHUT-OFF VALVES
- ★THERMOSTATIC CONTROLS
- ★TRANSFORMERS—SWITCHES
- ★THERMOPILOTS

Controls for air, water, steam, natural, manufactured and liquefied petroleum gases, light and heavy oils, etc., refrigerants such as: freon, methyl chloride, sulphur dioxide and ammonia.

A. C. or D.C., normally closed or open types. High and low pressures and temperatures. PROVED AND IMPROVED PERFORMANCE IS PROOF THAT YOU CAN'T BUY BETTER CONTROLS.

35-1

FOR COMPLETE SPECIFICATIONS request new Catalog and Service and Instruction Manuals.

GENERAL CONTROLS

801 ALLEN AVENUE GLENDALE 1, CALIF.

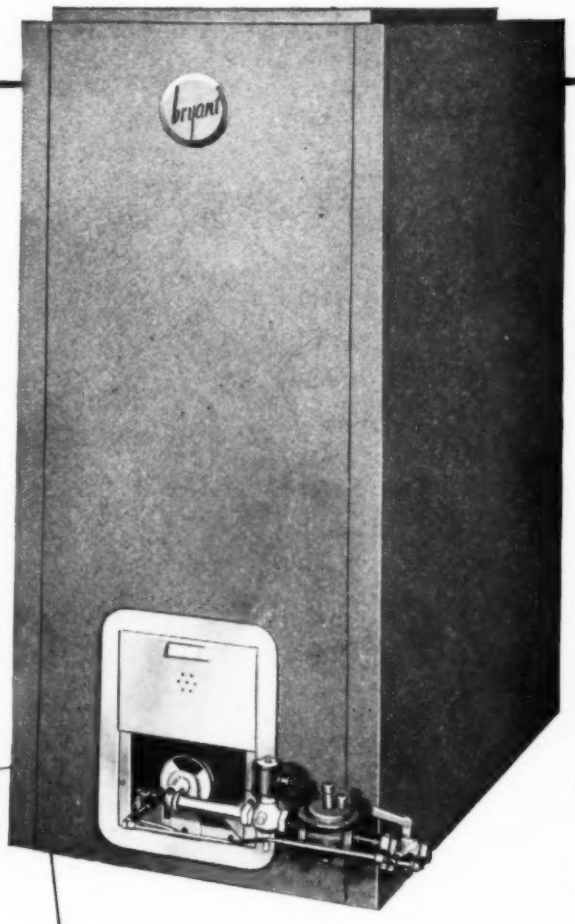
FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
HOUSTON • SEATTLE • SAN FRANCISCO • DISTRIBUTORS IN PRINCIPAL CITIES

AVAILABLE NOW

BRYANT STEEL GRAVITY WARM-AIR FURNACE

For immediate delivery . . . the furnace that will win those small homes jobs. Economical and completely automatic, this Bryant warm-air furnace gives you the *plus* to your sales story . . . a famous brand name and a price that is in line with small homes construction. Attractive in its Bryant Grey casing, this furnace is available with controls designed for natural, manufactured or liquefied petroleum gas.

See your Bryant distributor or branch representative *now!* He will ship *from stock* to get you *set* for extra profits! Bryant Heater Company, 17825 St. Clair Avenue, Cleveland 10, Ohio. *One of the Dresser Industries.*



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Venturi-Flo Performance Data

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AIR CONDITIONING
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SHEET METAL CONTRACTING

Getting Ready For The Adjustment Period

THE adjustment period business now seems to be entering is so full of imponderables that brash, indeed, will be the man who claims he can read all the signs and come up with only the correct answers.

Call the coming period what you will, what is needed now is a new balance between production, prices, purchasing power and wages. It makes no difference, actually, whether this level be lower or higher or the same as the present level—the important thing is to reach a balance where income and outgo allow every citizen to maintain a scale of living fair to himself and fair to all other citizens according to the worth of each citizen's contribution to the free enterprise system.

In some cases this will mean a larger income than the citizen now enjoys. In some cases this will mean a lower wage than the worker is now getting. In the case of business firms, it will mean a larger profit in some cases and a lower profit in others.

Such a balance won't be reached over night. Perhaps it won't be attained in 1947. The process of striking the balance is likely to be accompanied by much pushing and pulling by groups hoping to get just a little more than their fair share.

In so far as our own industry is concerned, in this adjustment period, we will have—as we always have had—two distinct groups to deal with. First is the home owner who buys our services in order to get a house or to make his present house a more comfortable place in which to live. Second is industry—meaning both manufacturing and commercial—which buys our services in order to improve its manufacturing or retail properties.

So it should be in order to examine the present situation of both these groups. Take the case of an "average" home owner. In most cases family income has been increasing since 1939. For example, the family which had a $2,000-$3,000 income in 1941 now probably has moved up to the $3,000-$5,000 group. There are probably 8 million families which made this jump. All sorts of figures have been published showing what has happened to such a family—one set of figures has recently been released by Research Institute of America as follows:

	1941	*% Price Increase*	*1947*
Money Income Received	$2,446		$3,731
Less			
Taxes	36		337
Gifts, Contributions, Savings	225		300
Left to Spend	$2,185		$3,094
Basic Living Expenses			
Food	$ 693	+73	$1,197
Clothing	262	+69	443
Housing	294	+ 3	303
Fuel, Light, Refrigeration	100	+15	115
Total Basic Expenses	1,349		2,058
Left for All Other Expenses	$ 836		$1,036

These figures, says RIA, are probably minimum because the table shows housing costs up only 3 per cent —this would be for a family still living under rent control or in a pre-war home—there will be hundreds of thousands of families whose housing costs have skyrocketed. The figures also presume that the average family has not changed its scale of living—a fact rather difficult to believe.

The figures show that this family does not have many more dollars to spend for improvements than it had in 1941—a dangerous situation until a dollar buys as much as it bought in 1941. Obtaining this equal buying position must be a basic aim of the effort to establish the new level of income and purchasing power.

In the case of the manufacturing or retail buyer, there is a hope that capital expenditures will take up some of the falling off in consumer spending and that the tremendous business demand for plants and equipment will assist in reaching the new level more quickly. However, contractors are reporting some postponement of industrial and commercial projects because of too high construction costs and a widespread

(Continued on Page 162)

Arnold Kruckman's

Washington Letter

"Bureaus" On The March Again

IT IS a source of bewilderment to observers in the Capital to find that the vast majority of business people throughout the country seem to be oblivious to the implications of the Greece-Turkey-Korea-etc. program. Almost every professional surveyor of life in Washington quite agrees with the recorded opinion of many Senators and Representatives that this plan to hedge-in ("contain") Russia will eventually cost the nation's pocketbook, via taxes collected by the Treasury, somewhere between $10,000,000,000 and $15,000,000,000 per year; and that this expenditure probably must go along annually, more or less on the same scale, for at least five years, and quite possibly longer. Aside from Greece, Turkey, Korea, it is expected practically every country in the world which shows any slight color of the courage to stand up against the Russians will be given sympathetic consideration when and if it makes a noise that sounds like need of money. There already is much discussion about the needs of Iran, Syria, North Africa, Britain, Italy, China, Singapore, some of the Balkan states, the Germans, France, and several Latin-American Governments. The Philippines have received a substantial number of millions with which the American Armed Services are building various heavy defense works in at least 20 areas in those distant islands in the Pacific. It takes little imagination to see that all this actual and potential work, for military and civilian purposes, means a large force of just ordinary people abroad, as well as at home, who must be the base of the special structure composed of technologists, expert professional personnel, and various trained and skilled persons of industry, commerce, finance and business, and those trained in the techniques of the economy with which the business of war, and preparation for war, is established and maintained. It apparently means the creation of new Federal units, or the expansion of existing units, to do the new kind of job. The purpose of the undertaking is to equip and help train military forces; to build military works; and to re-establish, or initiate the establishment of industries for the economies of the various nations. This means road-building, many kinds of structural construction, home-building, much heating equipment and appliances, even, probably, the re-creation of entire villages and towns. It is intended to supply our potential satellites with locomotives, new freight cars and passenger coaches, rails, trucks, hydro-electric plants, and the equipment of plants and factories with machinery and facilities to be furnished by our producers. In other words, if the plan is developed as it is discussed here, we will rebuild a large part of the world. And apparently we will do it with an organization which will be a Federalized and glorified UNRRA, controlled wholly by our own national Government.

Bureau Expansion Forecast

It is natural to anticipate all this will force established Federal agencies to expand. They will be compelled to do much more buying, more handling and shipping, more Customs works, more Governmental processing of all kinds. It means the procurement of huge volumes of materials, commodities, facilities, machinery, and equipment. And it means the employment of great numbers of men and women to work at home and abroad. This obviously spells that the Administration will have vast sums to spend. It would be unnatural if this great resource were not tinged with patronage under merely normal circumstances. The year ahead is not normal. It is the year when we will decide who will be the President for another four years. Surely it is still too recent to have forgotten how political fences were built in the campaign years of FDR. Patronage, and the funds that are dispensed with patronage and patronage jobs and favors, is the cement that makes a political fence strong and firm.

Mr. Truman is a sincere man, and he is an honest man, with a magnetic and attractive personality; but also Mr. Truman is a very practical politician, a politician who has had his training in the highly realistic political school of Missouri. The plan to "contain" Russia is unquestionably an earnest effort to prevent war; but it would be politically unnatural if the value of the by-products of that plan were not made useful, by those who control its administration, for their own domestic political advantage.

Truman Again?

Even on the Republican side of the aisle in Congress they are almost certain that Truman will be President again in 1948, unless some unusual drift or incident turns public opinion against him. The conviction became current after the Senate rallied to support Lilienthal, particularly when Senator Vandenberg called upon his colleagues to confirm Lilienthal because he is the choice of the President. Vandenberg's peculiar political gyrations have caused some interesting comments in the Senatorial cloakrooms. It is surmised that he naturally would like to be the next President. But, apparently, he is credited with the opinion that Truman, in all probability, will be the President. Vandenberg fancies himself as the great legislative authority in international affairs. He seems to love the honor that comes to him abroad and in the Embassies in Washington. If he cannot be President it is assumed he would ardently like to be the next Secretary of State. Apparently he is placing himself in the position where the lightning of choice may strike him from the Truman side as well as from the Republican side, if by any remote chance a Republican becomes the next President.

The Lilienthal Case

Political wiseacres in the Capital regard the Lilienthal incident as the deciding demonstration of the fatal ineptness among the Republican majority. Lilienthal is not popular with the members of Congress. He had most of the strikes against him in the political score. He is politically unattractive because he is autocratic, over-weeningly ambitious, uncertain as mercury in his loyalties, and the antithesis of a personality which has those steady and reliable qualities regarded as essential in a leader with large and practical business abilities. He is the darling of the ultra New Dealers, and is credited with most of the extreme social and political ideas of the New Dealer. There is little that should commend him to Republicans, to say nothing about those who strive to place sound and sincere men in places of public trust.

Yet it was the Republican group which made his confirmation possible, not because the Republicans themselves gave him a majority, but they allowed themselves to be hopelessly split and hopelessly outplayed in the Senate. It is probably difficult for the business people throughout the country to understand why this happened. The fact that it happened makes important the understanding of the episode. The positive element of the occurrence was the enormous pressure which was exerted upon the Senators.

It is doubtful, in this reporter's mind, whether any issue that has confronted this Congress thus far has brought such a lobby. Few writers have written about this lobby because it was an insidious and rather squirming and slippery thing upon which it was difficult to put a finger. Bear in mind, too, that with the dispersion of the New Dealers from places of fat salaries and power, a large number of them appeared in key positions in newspapers, periodicals, radio, and other places through which information is channeled to the people. One reason this Republican Congress is much misunderstood throughout the country is because the facts of its activities frequently are slanted so erroneously by mediums through which they reach you that we, here in the Capital, do not recognize the news when we see it as it appears in the publications you read, and the radios you listen to. All this, and the lobby of which some of this is a part, operated largely to inspire the Senators, upon whom it worked, with that sense of insecurity which flows from pressure from those to whom the individual may be under deep obligations of one kind or another. There is no doubt that some Senators had a great dread of being tagged as possessing racial antipathies, and voted for Lilienthal in order to demonstrate they had neither racial, religious nor ideological objections. The negative influence which swayed the Senators was the lack of unity among the Republican members themselves. There is no remote doubt if there were enough firm purpose and leadership among the Republicans to enable them to call a caucus, before the determination of an issue, with the confidence the leadership could depend upon the discipline of the caucus to effectuate the policy of the caucus, Lilienthal would have been snowed under by the Republican vote plus the vote of the independent Democrats. The prima donna reluctance of some Republicans to caucus, and the inability of the divided Republicans to make the decision of a caucus stick in order to insure party solidarity on critical issues, is the condition which makes the most experienced observers hopeless about the Republican political future.

Truman has gained immeasurably by the Lilienthal victory. It has not only given him the evanescent prestige of success with the casual voter throughout the country—who never was considered as strongly Republican, but more as strongly anti-administration, but it has solidly brought back to him the New Dealers who are now convinced he is their hope in 1948. This is an active, organized group, capably generaled, with great political skill. And, as has been shown, they largely sit astride the channels by which the public gets its information. This group has been doubtful about Truman through the past months. The doubt is now dissolved. It sees in Truman its 1948 victory.

Export Controls Continued

Assuming the Greece-Turkey-Korea-etc.-plan is placed in operation in the near future, it means the pipelines to take the things abroad must be rapidly filled. Apparently in anticipation of this probability Congress has virtually agreed to renew export and import controls until the end of 1948. The general

(Continued on Page 166)

How To Reduce Payroll Taxes Under Merit Rating* [Part 6]

IN addition to the major steps of reducing labor turnover and cutting down benefit charges described in AA issues of Dec., Jan., Feb., March, April, there are other specific steps an employer can take to insure tax-savings. Typical such suggestions are discussed in this Chapter.

Adjustments at Rate Change

If you are in a position to advance or postpone wage payments at the time a rate change becomes effective, you will be able to realize a saving. If a higher rate is being levied for the next year, making payment in the current year may save the difference between the old and new rates. If a lower rate is in the offing, postponing payment can mean a saving.

Remember, the *date* of payment does not necessarily determine the time a payment becomes taxable. Usually tax becomes due when a payment is "constructively paid"—credited to the account of, or set apart for, an employee so that he may draw on it at any time.

Voluntary Contributions

In the following states, employers are given *direct control* over their contribution rates. An employer is permitted to make voluntary, *unrequired* contributions —over and above the amount of contributions actually *required* of him—for the purpose of increasing his account balance and thereby improving his merit rating.

Colorado	Nebraska
Indiana	North Carolina
Iowa	Ohio
Kentucky	South Carolina
Minnesota	South Dakota
Missouri	Wisconsin

Certain Michigan employers may also make voluntary contributions.

In such states, a comparatively small contribution may spell a real tax saving on the entire payroll.

Example: Employer X in Missouri is debating the advisability of making a voluntary contribution to improve his merit rating. On June 30, 1946 (the computation date in Missouri), X has a reserve account balance of $39,980, and an average annual payroll of $400,000. Therefore, his reserve ratio for 1947 is 9.9% and he is assigned a contribution rate of 1.8%. Assuming a payroll of $400,000 in 1947, he will be required to pay $7,200 in contributions.

However—if X makes a voluntary contribution of $20 by July 31, 1946 (contribution deadline in Missouri), his account balance will be $40,000. His reserve ratio will then become 10%, and his rate for 1947 will be 0.9%. Assuming a $400,000 payroll for the year, his contributions would amount to $3,600. So by making a voluntary contribution of $20, X will save $3,600.

To determine whether a voluntary contribution is advisable compare the amount needed to bring your rate down with the amount you will save in contributions at the lower rate. You will have to compute this yourself—the state agency won't do it for you. Do it in time to make the voluntary contribution by the deadline in your state. Make your computations as accurately as possible. If your voluntary contribution is either too large or too small, you will get no refund, except in South Dakota. In Kentucky, refund will be made only if the contribution is made conditionally, i.e., on condition that it effect a rate reduction).

Note that voluntary contributions *cannot be used as credit against the federal unemployment insurance tax.* However, they are deductible from federal *income* tax as a business expense if they (a) are effective in reducing the employer's contribution rate, or (b) are nonrefundable and are made within the deadline in an honest effort to secure a reduced rate for the current or immediately succeeding year but prove to be less or more than the amount required to effect the reduction. They are *not* deductible as a business expense if they (a) do not succeed in reducing the employer's rate and are refundable, or (b) are made by an employer who has already achieved the minimum rate in his state.

Purchase, Sale or Reorganization

If you plan a purchase, sale, merger, consolidation or reorganization, don't overlook the merit rating aspects of the transaction.

Know how you stand *before* you act. If your business change does satisfy the requirements for transfer of the experience rate to the successor, then note particularly any time limit there may be for notifying the state agency of the succession.

Transfer of rating. In cases of *merger, consolidation* or *any type of reorganization* which changes the legal identity or form of the businesses involved, but where there is no substantial change in ownership or control, the succeeding company can probably inherit the merit rate of the predecessor. If it is a matter of *purchase,* or *sale* of business, a transfer of the merit

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rate to the purchaser will be allowed in only about half of the states.

When a merit rate is transferred, the succeeding company's future rate is based on its experience combined with that of the predecessor's. If the predecessor was not yet entitled to a merit rate, eligibility of the successor will be determined on the basis of both its and the predecessor's combined experience.

Voluntary State Coverage

If you do not have enough workers in any of the following states to be subject to the *state* payroll tax, but you are subject to the federal unemployment tax on all your workers, you may be interested in voluntarily subjecting yourself to the state tax.

New Mexico	New York
California	Ohio
Colorado	Oklahoma
Idaho	Oregon
Kentucky	South Carolina
Louisiana	Tennessee
Nevada	Virginia
New Jersey	Wyoming

Advantages of such a step are these:

1. At no extra cost for the first few years you may place yourself in a position to save money by merit rating each following year. If you expect to expand your operations in the state, this advantage is multiplied since your reduced rate will apply to a larger payroll.

2. The trend in state law has consistently been toward compulsory coverage of all firms. There is also a possibility that a federal law extension will encourage this coverage. Thus, voluntary coverage may simply bring you under merit rating a year or two earlier.

3. Your employees become covered by unemployment insurance, a factor in making employment with you more attractive. (In California and New Jersey it would be wise to consult the workers first, since coverage would mean a new 1% deduction from the employees' pay.)

Joint Accounts

In the following states two or more employers may have their accounts combined for the purpose of determining their rate:

Colorado	Missouri
Connecticut	New Jersey
Mississippi	Ohio
Washington	

A joint account can be a means of tax saving—but only if one of the companies is well above the line dividing two rates and the other is within reach of a more advantageous classification.

Example: Company A has a reserve ration of 15%; Company B a reserve ratio of 9%. If accounts are not combined, A receives a 0.9% rate, B a 1.8% rate. If accounts are combined, both A and B may receive a 0.9% rate.

Temporary Work

An *individual* proprietor operating in one of the states listed below may be able to exclude wages for *casual* labor from his taxable payroll:

Alabama	Michigan
Alaska	Minnesota
Arkansas	Mississippi
California	Nebraska
Colorado	New Hampshire
Connecticut	North Carolina
District of Columbia	Ohio
Florida	Oregon
Georgia	Pennsylvania
Hawaii	South Carolina
Indiana	Utah
Louisiana	Vermont
Maryland	Washington
Massachusetts	

The advantage of this exclusion is that no benefit charges to your merit rating account can result from such temporary work. Exclusion is also permitted under the federal law, so an additional advantage is a saving of tax on those wages.

Circumstances in which exclusion is permitted are: (a) the work is occasional, incidental and occurring irregularly; (b) it does not readily appear to advance, promote or further your trade or business; (c) services are not performed on more than ten days in one month or two consecutive months; and (d) a group of individuals does not work on the particular job for more than 200 hours in aggregate.

In *Alabama, Georgia, Maryland* and *Mississippi*, services can satisfy condition (b) above even though work is in the course of the business, so long as it is not in the *usual* course of the business. In *Indiana*, work cannot be incidental to the firm's business if it is to be exempt.

In Ohio *any* employer, including a corporation, may hire additional employees for work of four weeks or less without liability for contributions and benefit charges if (a) he secures permission from the Administrator, (b) employment in question is not furthering the regular course of his business, and (c) hours of work are less than the customary hours of employment for those who are regularly employed.

If your state does not have the exemption you cannot take advantage of the federal provision, since benefits are based on state taxable wages. However, you will be able to save the .3% federal tax.

Rehiring Workers Drawing Benefits

It will cut down on benefit charges and thus improve your merit rating standing if you can reemploy former employees who are claiming benefits. If you can rehire them soon enough, you may eliminate charges entirely.

You will usually receive a notice when a former employee is awarded benefits chargeable to you.

In *reserve ratio* and *benefit ratio* states, you will gain most from reemployment of workers with higher benefit rates and longest period of eligibility. In *benefit wage ratio* states, try to rehire—*before* the charge is made—those to whom you paid the greatest amount of base period earnings.

(*Continued on Page 163*)

Cut Your Price— Not Your Throat!

By Arthur Roberts

Signs are unmistakable that the day will soon arrive when it will be necessary to sell instead of consent to accept business. Since price-cutting is a normal part of sales technique, in those ordinary days which we have nearly all forgotten, this article is devoted to the "how and why" of price-cutting. Mr. Roberts is well-qualified to discuss the subject by virtue of his extensive background in accounting and related business functions.

WARM air heating dealers and sheet metal contractors have often asked us how department stores and other similar merchandisers seem to flourish by price-cutting consistently. Their puzzlement springs from too little understanding of a complex subject. To most members of this industry, a price-cut is a price-cut, much like "Pigs is pigs," but there is more to the story and it deserves exploration because, unless one has a comprehensive understanding of this important phase of merchandising, its scope, operation and source, one cannot cope with the problem successfully.

Moreover, what we say here is "Proof positive" that dealers and contractors must compute costs and sell aggressively to earn maximum profits in the postwar period when competition will be in high. Merchandising is more than displaying your wares, more than quoting a price that reflects cost plus overhead plus net profit, because these are varying factors that must be coordinated properly with all the elements that comprise successful business management; sales, purchases, collections, credits, display, stockturn, accounting, efficient job costing, pricing and competent business analysis, if one is to earn maximum profits.

How Does It Apply

"What has price-cutting to do with all this?", you are probably asking yourself by now. The answer is simple. We have spent years contacting merchandising men in different fields and know that few appreciate the role that the price-cut plays in barter. Don't think that we advocate slashing prices, we merely want to expound on a phase of merchandising about which you should have a comprehensive understanding if you want to be a four-square businessman. To combat a thing, one must know all about it, and too many dealers and contractors in this industry price-cut without sufficient knowledge of this important element in barter. They see certain retail outlets get by handsomely with this device and they follow blindly, going into the red. We hope the following breakdown and commentary will clarify this intricate matter.

Price-cuts fall into these classifications:

Types of Cuts

1.—Clearance cuts used on clearance sales to move shelf-warmers, trailers, obsolete items and seasonal goods. These are merchandising cuts (good business) not price-cuts.

2.—Economic cuts resulting from over-loaded markets. Beyond the control of the businessman. Controlled only by the law of supply and demand. Businessmen should never try to counteract the law of supply and demand because it will eventually slap them down. Remember OPA and other government controls.

3.—Technological cuts. This price-cut is always operative in a free market backed by industrial efficiency. In 1915, a thing that looked and ran like an automobile cost $5,000 or more, a tire that might last 3,000 miles, around 100 bucks, in 1925 a radio bringing in local stations only and lots of static cost $500, in Colonial days, they burned down houses to get the nails in them because nails were scarce and costly before the invention of nail-heading machinery, you get more value in warm-air heating equipment today than in 1920, and so on, ad infinitum. This cut is also outside the compass of individual achievement.

4.—Promotional cuts to build volume, such as loss leaders. The chains grew fat on such knifing so it

does get results, but, in this field, the promotional cut is "out." Loss leaders are used to bring in customers to sell them high-margin items that more than make up for the loss on the "bait."

5.—Goodwill cuts. Merchandisers able to give such cuts are looking to the future because they are helping to decrease the cost of distribution, getting goods to the consumer at lower prices and still earning satisfactory profits, a goal desirable in our postwar economy if full employment is to be maintained and free enterprise sustained. The goodwill cut is born of greater managerial efficiency by which costs per sale or job are reduced, the savings passed to customers in the form of price reductions.

6.—Sucker cuts. Arbitrary cuts just to meet the other fellow's prices. This is the cut which gives the average warm-air heating dealer and sheet metal contractor fits. The wise merchandiser never uses it and it differs from the other classifications as Democracy differs from Communism. All the other cuts are based upon business analysis and experience records that show how to reduce prices beneficially. If department stores and other merchandising specialists were to price-cut in the fashion of many gullible members of this industry, they would find themselves up that noted creek minus means of locomotion. They, however, keep their feet dry by adequate cost records and supervision, keen analysis of prior activity before making reductions, and the utilization and effective synchronization of all essentials underlying sound business management.

Overhead Is Always With Us

Clearance cuts, promotional cuts and goodwill cuts, paradoxically, do build profits or minimize losses, although the operation works in reverse. The conservative businessman keeps his stock on hand until somebody buys it. The aggressive merchandiser keeps his stock moving and if it doesn't move fast enough, he takes action, often baiting his promotions with price reductions. "But, doesn't this cut profits on these sales, often bring losses—and what good is selling merchandise at a loss?", asks the tyro. Such querists consider the purchase price of merchandise as total cost, overlooking over-all cost. The cost of your resale stock or supplies increases day by day because of the overhead charge against it so you earn less money on your wares the longer you hold them. You're a price-cutter in reverse if you let overhead pile up on your wares because you wait until somebody buys them instead of pushing with vigor for business to get a profitable turn or if you do not sell enough merchandise with labor so that labor losses eat into the profit on merchandise and materials.

Move It or Cut It!

Overhead, the biggest of all price-chiselers, is behind many price-cuts you see advertised by department stores and other successful merchandisers. One of the biggest stores in the country buys a product, prices it at regular mark-up; if it doesn't show the average turn for items of this type within the month, the price is cut 10 per cent; a fortnight later another 10 per cent; if it still lags, maybe another 10, and then down to the basement at cost. If it doesn't move at cost, it is cut until it does pass out. This is a plan that this store has found more profitable than hanging on to goods indefinitely at regular list. The outsider handling the same item, experiencing equally poor customer response, would probably call this store a price-cutter, whereas, its management is using good business sense based upon experience figures. The outsider may carry the same merchandise for months, complimenting himself on his adherence to original selling prices, yet, when he finally sells the lot, he may earn less than the department store quoted, because overhead on the shelf-warmers has increased over-all cost so that profits have vanished.

No Ceiling on Effort

Although such merchandising cuts are not applicable to this field, the reasons for such reductions, the invisible toll taken by overhead on cobweb lines or low shop production, applies to everybody's re-sale wares, so the dealer or contractor should keep his stock and journeymen moving, otherwise, he's a price-cutter in principle, if not in practice. This means aggressive advertising and selling promotion and less belly-aching about the macabre practices of price-chiselers.

When the market is in short supply, price-cutting goes into hiding but it springs into action when goods flow freely to market again. Now that restrictions are off, the dealer or contractor may not wait very long to experience a buyer's market and by the natural law of supply and demand, price reductions are rejuvenated. Under OPA and other controls, the law of supply and demand sulked and our economy got the palsy. Regardless of how you feel about price-cutters, that old law of supply and demand still functions. It says to you, "Play the game my way, sell your wares aggressively, and live in a palace. Stick to your showroom or shop, building castles in the air, heaping invective on price-cutters within or without your industry, and you'll end up on the wrong side of the railroad track."

S-Day Approaches

Newspapers all over the land, for the first time in years, are advertising real bargains in soft goods, merchandising cuts brought about because the law of supply and demand has come into its own again. Moreover, money is less plentiful, radios, home appliances, furniture and other heavy lines will be competing with heating equipment for the consumer's dollar. These trends should be the handwriting on the wall for members of this industry who are stalling the adoption of an aggressive merchandising program. Before long hard goods should also be plentiful and the warm-air heating dealer and sheet metal contractor will be up against price competition inside and outside the industry that can be beaten only with planned promotions of their wares and effective follow-through. Griping against the evils of price-cutting won't help because many price reductions are inherent in free barter. A more realistic attitude toward a necessary evil is the best approach to intelligent management.

NEWS SUMMARY OF THE MONTH

Warm Air Furnaces

FIRST quarter, 1947, production of warm air furnaces is reported to be about ten per cent below the fourth quarter of 1946. January production was 80,301 units of all types, compared to approximately 78,000 units in December. February output decreased to 68,700 furnaces. Factors contributing to the February decline were reported as insufficient light gauge steel, shortages of coke, pig iron, and fractional horsepower motors and manufacturing shut down due to reduced supplies of gas for manufacturing purposes. March production is estimated at 71,000 units.

Department of Commerce anticipates increased delivery of fractional horsepower motors during the latter part of March and April, but no balance in motor production and sale is as yet in sight.

◆

Building Controls

IN a surprise announcement Housing Expediter Creedon recently stated that the overall limit on non-housing construction will continue until 1948 with a ceiling of $50,000,000 per week remaining in effect until "the material and labor situation justify a change." The restrictions now in effect are as follows:

Veteran preference will be continued on both sale and rental of new houses; the square foot limitation on size of houses will be continued as well as will be the limit of one complete bathroom per house; there will be less preference for building materials under this new RR and RRR rating, but manufacturers of building materials and equipment will probably continue to have some benefits from the voluntary allocation agreement which the government has been working out with producers of basic raw materials. For example, steel will be channeled to building items in the same proportion for each of the last three-quarters of 1947, as was the case during the first three months of 1947.

There may be some impetus to new house construction because of recently announced FHA rules: (1) houses built with HH ratings can now be sold for more than the previous $10,000 to $17,000 ceiling in order to cover the increased cost of important conveniences previously omitted; (2) in establishing initial rentals, FHA now authorizes an anticipated net return of 6½ per cent with a 7 per cent allowance for vacancy which perhaps will stimulate construction of new rental properties.

◆

Oil Burner Production

AS OF April 1, Department of Commerce reports that the production of oil burners reached an all time high of 580,326 units in 1946.

The department reports that various economists have predicted a total of 3½ to 4½ million oil burners in use by 1950 and a rate of production of approximately 420,000 burners per year for the years 1947, 1948 and 1949. 1947 production may be below that of 1946 because of continuing difficulties with motors, transformers, and certain other oil-burner parts.

◆

America's Economy in 1950

THE U. S. Bureau of Labor statistics has recently issued a pamphlet forecasting the appearance of American business in 1950. Very briefly, this study foresees 61,000,000 job seekers, of which 59,000,000 will be job holders. Of this 59,000,000 job holders, 39,000,000 will be private non-farm employees and the rest will be farmers, business men, government workers, etc. With prices at about the same level as 1947, one-quarter of the people will have incomes below $2,000; almost another quarter will have incomes above $5,000 and the rest will be the in-between people. As to purchases, the Bureau foresees a demand for twice as many cars as in 1939, half again as much clothing as in 1939, 40 per cent greater demand for food, and 75 per cent increased demand for housing. Industry, said the Bureau, will require almost twice as much capital goods, such as trucks, machinery, plants, etc.

As to employment in 1950, the Bureau is not too optimistic forecasting that if wages remain high, people will save too much, business will invest too little, and some lines of goods just will not be sold.

The Bureau declares that in 1950 we will not have nearly enough plants and industry to absorb the workers who will want to work or to supply the goods they will require if they are all working. Plant construction, therefore, to make up this deficit, will require many years of activity by the construction industry.

◆

Asphalt Roofing and Siding

JANUARY production of 7,115,000 squares of asphalt roofing and siding was the highest in the industry's history. Although no report has been issued, indications are that February and March production will be very near to the January level, giving a new production record for the first quarter of 1947.

◆

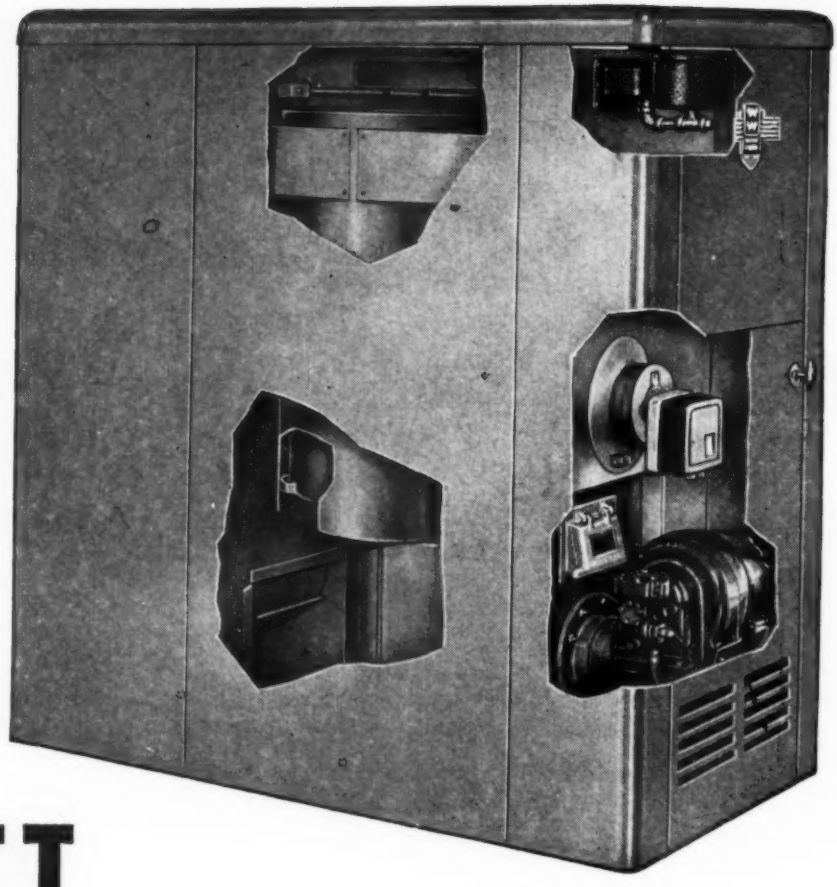
Gas Restriction Ruling

A NUMBER of large gas utilities have recently announced that due to the seasonal rise in temperature and less demand for gas and because the utilities wish to dispense with limitations and restrictions as soon as possible, certain emergency rulings have now been amended so that new gas heating equipment can be installed where the new equipment replaces obsolete gas heating equipment or worn out gas heating equipment, but may not be installed where gas replaces some other fuel. Also, that in special medical hardship cases, supported by satisfactory evidence, new gas heating equipment may be installed upon proper application to the gas utility.

(Continued on Page 148)

RESIDENTIAL AIR CONDITIONING *Section*

DEVOTED TO HOME AND SMALL COMMERCIAL AIR CONDITIONING



It's What's Under the Casing that Counts !

Waterbury

Oil Fired Air Conditioner

The Waterbury Oil Fired Air Conditioner is a modern, compact, attractive unit, economical to buy—economical to operate. It is enclosed in an eye-appealing casing that is a compliment to the most modern basement—but what is equally important to you—because of the efficiency and quality of what is UNDER that casing, you are saved annoying service calls.

Whether you are installing a simple gravity job or the most complete air conditioner, Waterbury's careful engineering and precision manufacturing insure a satisfied user—and freedom from service calls for you.

Furnaces for every size home and every type fuel—from gravity models to complete air conditioners.

Waterbury means long life, economy of operation and service-free installation.

THE WATERMAN-WATERBURY COMPANY

1122 Jackson St. N. E., Minneapolis, Minn.

"Stucco's" Are Responsible For Most of Our Evaporative Cooling "Skeletons"

By Martin E. Marsalis

Associate Member, A.S.H.V.E.; Member, American Society for Metals;
Owner, American Metal Products Company, Fort Worth, Texas

STUCCO—you know—is the stuff people daub on houses. No insinuation is made here that most houses are not finely made, but, in case some rough workmanship exists, stucco is wonderful for hiding cracks and errors.

Occasionally, some workman in our plant will turn out a job which will not pass inspection. Upon this luckless fellow, we promptly bestow the title of "Stucco Mechanic." Inferring, of course, that no paint could hide the flaws in his product; that only a thick substance, such as stucco, could accomplish this purpose. We have also adopted this term in our office, in facetious reference to the failings of one another.

Many people who manufacture, sell, install and use evaporative air coolers are "stucco's." But "stucco's" are having hard going, today, in the rapidly growing field of evaporative air cooling, because aggressive, constant, missionary work and dealer education by conscientious manufacturers and their jobbers have begun to show favorable results. No reason exists today for the dealer to buy units of inferior quality, or to do a poor job of selling. Proper information is available, for the asking.

Summer Comfort at Small Expense

Nothing has ever been wrong with the basic principle involved in evaporative air cooling. It remains as dependable today, as it was in Adam's time. Had this fine, inexpensive means of summer cooling, in its present package form, been developed and marketed exclusively by qualified persons, dealers and users would have escaped the headaches some of them have experienced, from improper knowledge, or inferior units.

Very frankly, many purchasers become thoroughly disgusted with the results they obtain. Since a person who has been "stung" will "holler" loud and long, evaporative air cooling has received too many "black eyes." But no person who has ever enjoyed the benefits obtainable from a good cooler, properly installed and used, would part with his unit.

Let us, then, boldly drag some of evaporative air cooling's skeletons out of the closet and take a good look at them. Here are a few case histories from the author's files. No two users had units of the same manufacture.

Case Histories

No. 1—COMPLAINT:

"Our cooler doesn't seem to deliver enough air. We have an electric fan the same size as the one in the cooler, and it delivers a lot more air than the cooler fan does."

ANALYSIS:

This cooler had a nice appearance. It was made by a large company, but with little or no experience in air handling, or air treatment. The pad was too small, so the unit always delivered excessive moisture. The pad was laid tightly against "louvered" exterior of cabinet and the louvers blocked the entrance of about two-thirds of the air that would normally have entered. This sharply restricted the air delivery of the fan. Test made with an electro psychrometer revealed a moisture content in the air entering the room 30 per cent higher than would have resulted from a cooler of proper design. A sound level meter revealed a decibel reading 18 per cent higher than necessary.

CURE:

With a pair of "tin snips" most of the louvers were cut away. This greatly increased the quantity of air flow and lessened the noise. Excessive moisture dropped to 16 per cent. Excessive noise dropped to 13 per cent. Air delivery was increased approximately 27 per cent (checked with Velometer).

COMMENT:

Although results were still considerably sub-standard, the customer was satisfied.

No. 2—COMPLAINT:

"I never saw anything like it. I never did want my husband to buy it, in the first place. It looks like a bale of hay hung on our house. My wall paper is all wrinkled and my furniture drawers stick. I keep paper on the floor to keep the unit from spraying water on my floor and ruining it."

ANALYSIS:

This unit had a water distributing system consisting of a small copper tube lying across the top of the cooling pad and with holes drilled in the bottom of the tube. Sharp streams of water "bounced" out into the airstream and were promptly delivered, by the fan,

into the user's room. The fan blade was too close to the cooling pad and air was highly saturated with moisture.

CURE:

No cure was possible here because of inherent poor design and construction.

COMMENT:

This user is deeply prejudiced against evaporative air cooling, condemning *all* such coolers, not realizing that coolers are available which will give entire satisfaction.

No. 3—COMPLAINT:

"My first month's water bill was $7.50. And still we could not keep 'dry spots' off of our pad."

ANALYSIS:

This was a "run through" unit, having no water recirculating pump. Connected directly to a nearby water line, regulation of moisture supply to cooling pad was by means of a small valve and means provided for distributing water to the cooling pad was very poor. User was attempting to overcome this flaw in design by running unit with water valve "wide open." This excessive quantity of water was responsible for user's high water bill.

CURE:

Complete cure was obtained only by entirely re-constructing the unit. By means of some reasonable changes and the installation of a recirculating pump, the water bill was sharply reduced. However, the cooling pad was never uniformly moist and results were not of the best. Customer was only partly satisfied.

COMMENT:

Recirculating pumps have the same relationship to an evaporative air cooler, as the self starter has to an automobile. The starter does not contribute to motor performance, but does make a great contribution to the user's convenience. Pumps add nothing to a cooler's performance, but they assure proper water supply, if cooler design is correct, with nothing left to the user's judgment. Water consumption is lower. "Run through" units are entirely satisfactory *IF* the design is correct.

No. 4—COMPLAINT:

"The darned old things 'stink.' I had one made in a tin shop and it was pretty good, at first. But then it started to stink. We tried to get our money back, without success. My husband insists on keeping it going. Says he can't sleep nights, without it. I hate it."

ANALYSIS:

Upon entering this user's home, there was such a powerful "fishy" odor that analysis was almost possible without examination. The manufacturer had used pine excelsior (common type) in cooling pad. The unit was equipped with a recirculating pump, but no means was provided for periodical draining of the in-built, water reservoir. A poor means was used for fastening pad in position and considerable sagging had occurred. Hot air and mosquitoes were entering apertures left.

CURE:

A new cooling pad was installed. This pad was made from genuine ASPENWOOD fibre and properly secured in place. A drain flange was installed in the reservoir and the customer was instructed in proper care and use.

COMMENT:

The changes made resulted in user satisfaction.

No. 5—COMPLAINT:

"Our cooler worked well the first year, but this year it doesn't seem to do much good. We had a new cooling pad put in about a month ago and in spite of our paying the man that did the work, $25.00, we can't see any difference."

ANALYSIS:

The new cooling pad was too small, leaving open spaces around the edges which admitted hot air. The copper tube which supplied water to pad, by means of numerous small holes looked all right, however, one season's operation on average city water resulted in chemical deposits, such as lime and gypsum, on the inside of the tube and in the spray holes. The serviceman had "reamed" out the small holes, but much of the deposit reamed out was pushed back inside pipe so water pressure promptly re-stopped the small holes with the small particles.

CURE:

A new cooling pad of correct size was installed and a new water distributing tube was installed.

COMMENT:

This unit was noisy and "bundlesome." Air delivered was excessively moist, due to flaws in unit design. Customer was satisfied, but will lose this satisfaction upon first contact with a really good unit. Serviceman had charged at least 3 times too much for his pad and work.

The basic problems involved in designing and manufacturing DEPENDABLE Evaporative Air Coolers, are complex, but no excuse exists for the unhappy experiences related here.

Fortunately for the industry there is a much higher percentage of enthusiastic, satisfied users, than of the kinds set forth in this article. These thousands of satisfied users unquestionably will endorse a truism of many lines of home equipment: buy only brands offered by manufacturers with "time proven" experience in the design and use of the unit.

Reliable units have fair, dependable guarantees. Complete instructions for installation, operation and maintenance are packed with each unit. Sales and technical manuals covering the simple "know how" of evaporative air cooling are available from all reputable makers. There is no need to be a "stucco mechanic."

Editors Note:

Last year AMERICAN ARTISAN *published a series of articles by Mr. Marsalis in which the basic principles of correct design and operation of an evaporative cooler were set forth in easy-to-understand language. This series was reprinted by the author and is available from the author at a cost of 25 cents per copy.*

TIME LAG in Floor Panel Systems Depends On the Floor Mass *UNDER* the Air Space

By Warren E. Wilson
Consulting Engineer

THE use of a massive floor slab as the heating medium in warm air panel heating of houses and other buildings has been accompanied by certain inertial effects which are frequently objectionable. In order to fully understand the phenomena which have been observed and make it possible to predict the effect of the mass of a floor panel heating system in producing a time lag between indoor and outdoor temperature, an elementary theory of the operation of such a system has been developed and the equations describing its performance are used in the interpretation of experimental data. Confirmation of the theory by experiment justifies the prediction of performance under any given set of circumstances and with any given floor panel heating system.

It is shown that the principal factors determining the time lag of a floor panel heating system are the amount of mass, located *below* the ducts carrying the heating medium, which responds to changes in temperature of the heating medium and the temperature of this mass at the beginning of a daily heating cycle.

The effect of the mass is illustrated strikingly by comparing the variation of indoor temperature with time during a heating cycle with under floor masses of 10,000 to 100,000 lbs. respectively. A ratio of time of recovery of approximately five to one is shown to exist in the two cases with 30 hrs. required to bring the indoor temperature up to comfort level with the more massive system.

Means of minimizing the inertial effect of the mass of the system are discussed and final recommendations include calling for reduced mass and underfloor insulation.

Theory

The elements of a theory of the operation of a floor panel heating system are relatively simple and easily understood. In Fig. 1 the essential elements of such a system are shown in a line diagram. Heat is supplied at the rate H_s by means of heated air passing through ducts which are located in a massive floor which may for the purpose at hand be considered to consist of an upper mass M_1 and a lower mass M_2. The building consists of rooms with walls and roof.

In Fig. 2 the first step in the distribution of the heat is illustrated. Heat is supplied at the rate H_s to the ducts by the air. This heat must be dissipated in one of three ways. It must either go upward (H_u), downward (H_d), or out (H_p), through the periphery of the duct system. This elementary and perhaps trite consideration leads immediately to the vital and fundamental concepts of the heat flow in this system.

In Fig. 3. further steps in the heat flow are outlined. The heat which flows downward (H_d) must be dissipated in two channels. A portion (H_g) flows to the ground below the slab. Another portion remains in the slab to raise its temperature and the rate of storage of heat in this manner is given by the product of the rate of change of the slab temperature, its mass and the specific heat of the mass.

The heat which flows upward (H_u) is dissipated in a similar manner, part going to the warming of the

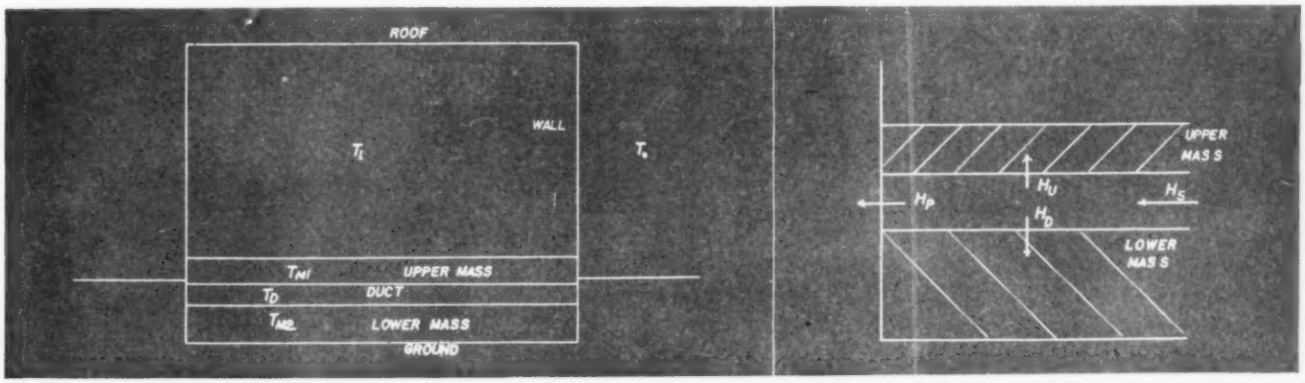
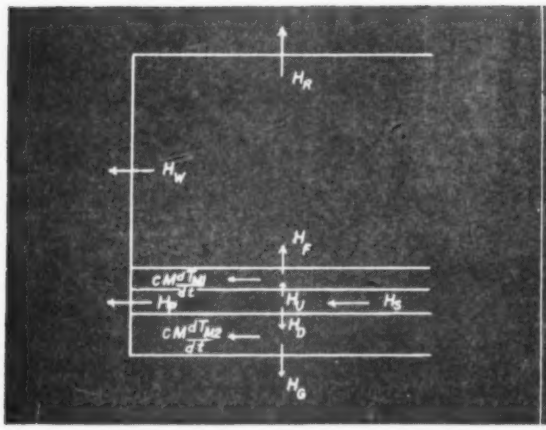


Fig. 1 (left)—Essential elements of radiant floor panel heating system, heat being supplied by means of a fluid passing through ducts in a floor which may, for the purpose at hand, be considered to consist of an upper mass M_1 and a lower mass M_2.

Fig. 2 (right)—The heat supplied, H_s must be dissipated in one of three ways: Up, down, or out through the periphery.



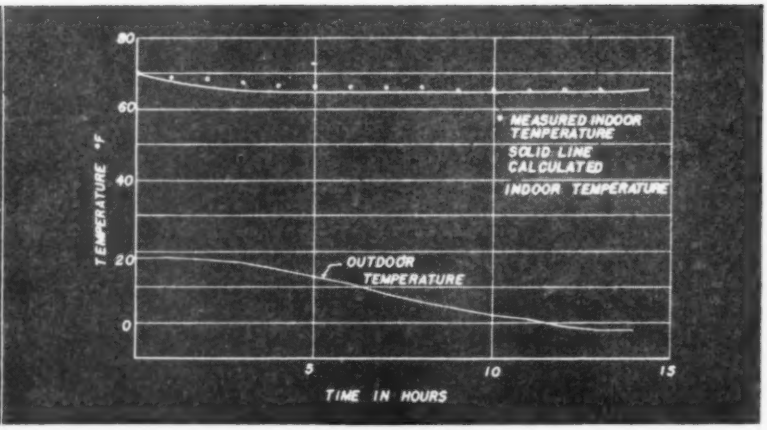


Fig. 3 (left)—Of the heat which flows downward, a portion goes to the ground and the rest remains in the slab to raise its temperature. Of heat which flows upward, part warms slab and part compensates for heat loss of walls and roof.

Fig. 4 (right)—Temperature record for test structure for December 12, 1945.

panel mass and part (H_f) to warming the air in the room. This latter rate of heat flow (H_f) must equal the combined rate of flow of heat through roof and walls, neglecting warming of the mass of walls and roof.

The heat flow through the perimeter of the slab is assumed to be free from inertial disturbances and is considered to be proportional to the difference in duct and outdoor temperatures.

To understand the changes in the temperatures of slab and living area under specified conditions of heat input and outdoor temperature requires that the preceding description of the paths of heat flow be translated into mathematical language. This operation results in four equations, two of which are ordinary algebraic equations and two of which are differential equations. These four are solved simultaneously to yield a single second order linear differential equation in T_i, the indoor temperature. The solution of this differential equation yields the following expression for the indoor temperature T_i;

$$T_i = c_1 e^{-r_1 t} + c_2 e^{-r_2 t} + AT_s + Bm + C + Dmt \ldots . (1)$$

Where: t is the time in hours

T_s is the outdoor temperature at the time $t = o$

m is the rate of change of the outdoor temperature T_o whose variation is assumed linear and given by the expression $T_o = T_s - mt$

A, B, C, D are constants of the heating system including the masses M_1 and M_2, the specific heat of these masses, the heat transmission factors of wall, floor, roof and perimeter of slab.

C_1 and C_2 are arbitrary constants determined by the initial conditions at time $t = o$.

In the derivation of this equation several simplifying assumptions have been made but appear to be justified in an elementary treatment of this type.

The assumptions which have been made are:

1. The temperatures at all points in mass M_1 are identical at any instant
2. The temperatures at all points in mass M_2 are identical at any instant
3. The temperatures at all points within the heating air ducts are identical at any instant
4. The ground temperature is constant
5. The rate of heat supply from the furnace is constant
6. The mass of walls and roof is negligible.

Experimentation

The theory, briefly outlined above, was developed about one year after a comprehensive series of temperature measurements had been made in the Green's Ready-Built Solar Home located in Rockford, Illinois.* These measurements provided much material which has been used to check the validity of the theory. Measurements of temperatures of room, outdoors, floor slabs, sub-floor material and ducts were made by means of a recording potentiometer and thermocouples provided by the Minneapolis Honeywell Regulator Co.

The heating system of the Solar Home has been described in other publications, but is illustrated in Fig. 11 for reference here. The heat is supplied by means of forced warm air conducted through clay tile pipe and introduced to hollow clay tile which forms both the floor structure and heating ducts. The cold air is returned through sub floor tile pipe ducts to the blower.

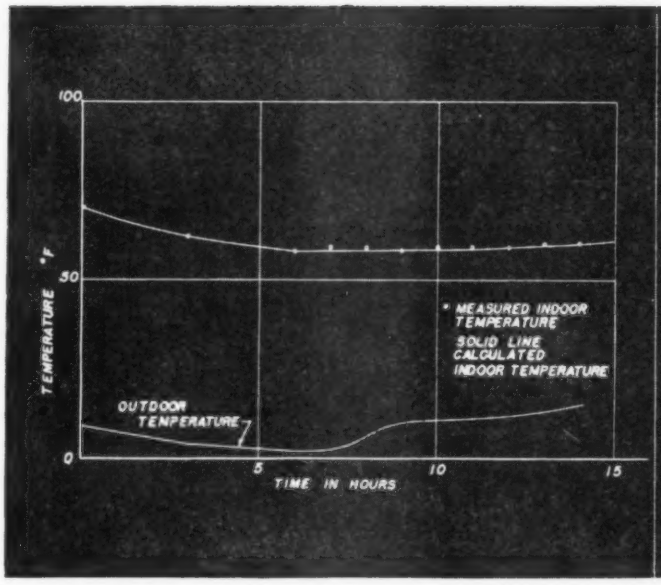
Temperatures at various points in the house and heating system were recorded continuously over a period of approximately two months. Several records have been selected as illustrative of important points in the operation of the radiant floor panel heating system and are reproduced in Figs. 4 and 6.

Analysis of Data

In analyzing the data it was necessary that certain assumptions be made and physical characteristics of the house and heating system be determined. In Table 1 are shown the pertinent constants used in calculations related to the Solar Home.

In Fig. 4 is shown the record of indoor and outdoor

**Solar House Heated by a Warm Air Floor Panel, by John E. Peterson.* AMERICAN ARTISAN, *December, 1946.*



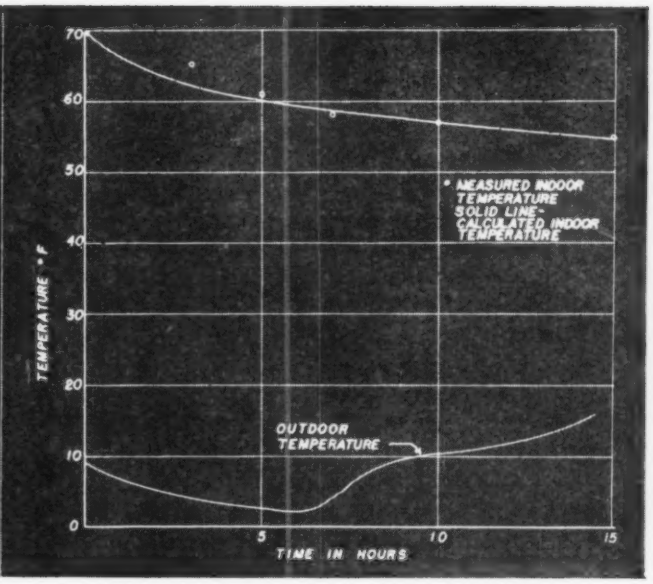


Fig. 5 (left)—Temperature record for January 1, 1946. Fig. 6 (right)—Temperature record for January 22, 1946, when heater was turned off in the afternoon and left out of operation during the night.

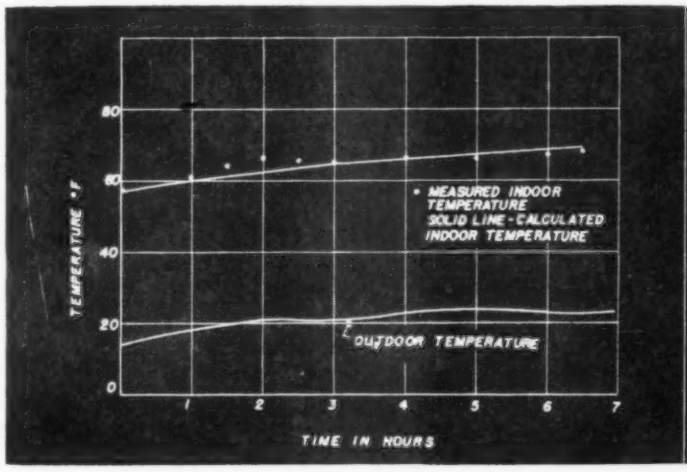
temperature for December 12, 1945. During the period indicated, the furnace operated continuously. The smooth solid line is the *calculated* temperature for the period beginning at t = o, shortly after sundown when the *indoor* temperature fell to 70° F. The plotted points represent the measured indoor temperature. This record was selected to illustrate the lag of the system when outdoor temperature falls fairly rapidly. (Ed. Note: This is for the closed panel system described in the December, 1946 AA with no heating air admitted into the rooms).

In Fig. 5 the record of January 1, 1946 is reproduced showing the same details as in Fig. 4. It will be noted that while the outdoor temperature fell less than on the previous date it was initially lower and apparently the lower mass temperature was initially so low that the system developed a very objectionable lag. It is noteworthy that during the last several hours of operation the outdoor temperature rose rapidly and the indoor temperature failed to respond. The theory explains this fully in terms of equation (1) as indicated by the solid line calculated from this equation. In Fig. 6 are shown data obtained by turning off the house heater on the afternoon of January 22, 1946 and leaving it out of operation during the night. The agreement between theory and observation is excellent in this case and indicates clearly that the fundamental concepts included in the theory are sound and that the simplifying assumptions are either compensating in nature or do not in themselves greatly affect the accuracy of the predictions of the theory.

TABLE I

Lower mass—M_2	105,000 lbs.
Upper mass—M_1	20,000 lbs.
Heat loss of walls and roof	550 btu/hr/°F temp. diff.
Heat loss of perimeter	90 btu/hr/°F temp. diff.
Heat loss to ground	100 btu/hr/°F temp. diff.
Area of floor	1100 sq. ft.
Specific heat of mass	0.25 btu/lb./°F

The warming up period following the shutdown illustrated in Fig. 7 shows good agreement between



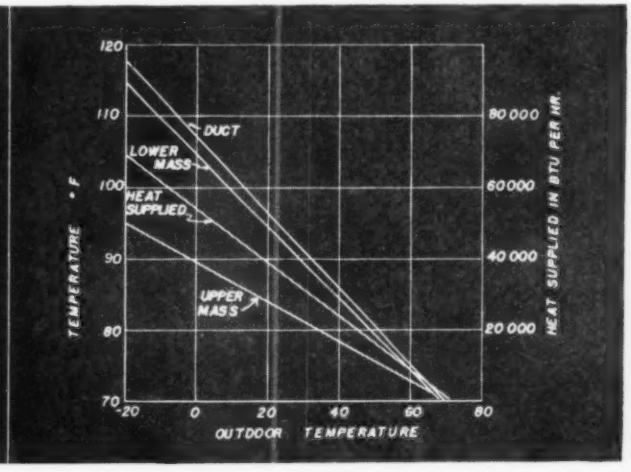
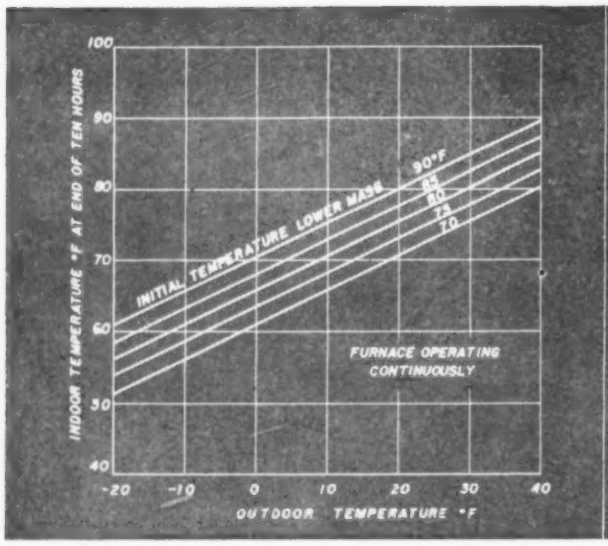


Fig. 7 (left)—The warming up period following the shutdown shows good agreement between theory and observation. Fig. 8 (right)—Equilibrium temperatures for test structure with indoor temperature of 70 F.



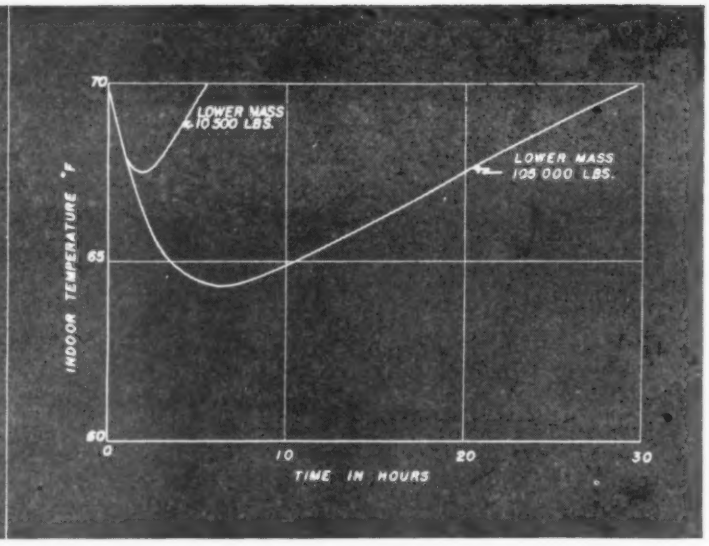


Fig. 9 (left)—Effect of temperature of the lower mass. Fig. 10 (right)—Assuming initial conditions of 70 F inside, of 0 F outside, and a lower mass temperature of 80 F, the inside temperature at various times later is shown for a lower mass of 105,000 lb. and 10,500 lb. It is clear that the lag in the former case is intolerable, as 30 hr is required to obtain a room temperature of 70 F.

theory and observation although there is evidence that while sunlight was excluded from the living area by curtains some warming was due to solar energy since the initial rate of rise of temperature is more rapid than theory would indicate.

Prediction of Mass Effect

The experimental verification of the theory illustrated above justifies use of the equation for T_1 in discussing the effect of changing the mass of a floor panel heating system.

In order to carry out this discussion Figs. 8, 9, 10 have been prepared. To reduce the amount of mathematical work the physical constants of the Solar Home have been used in preparing these charts.

In Fig. 8 the equilibrium temperatures for lower mass T_{m2}, upper mass T_{m1}, air in the ducts T_D are shown for any outdoor temperature T_o. The rate H_1 at which heat must be supplied for a given outdoor temperature under conditions of equilibrium is also shown. It is interesting to note that during the period of record, described previously, equilibrium of the system was not attained, although the capacity of the heater (65,000 btu/hr.) was more than adequate to handle equilibrium conditions.

It is noteworthy that an upper mass temperature of 85° F, which is generally considered the maximum permissible for floor panels, will sustain equilibrium at approximately 15° F outdoor temperature, *but at no lower temperature*. To sustain equilibrium at –15° F which corresponds to a rate of heat supply of 65,000 btu/hr., the maximum attainable with the installed furnace, would require a floor temperature of approximately 96° F.

It is easily determined that were it possible to attain and maintain equilibrium, neither the ground nor perimeter losses would be unreasonably large. For example at 0° F outdoors the equilibrium conditions are:

Upper mass temperature	89.5° F
Lower mass temperature	105° F
Duct temperature	107° F
Rate of heat supply.....	54,000 btu/hr.
Heat loss to ground	5,500 btu/hr.
Heat loss at perimeter	9,600 btu/hr.

In this case the total of ground and perimeter losses represents approximately 28% of the heat supplied.

In Fig. 9 the effect of the temperature T_{m2} of the lower mass is shown by plotting the indoor temperature T_1 at the end of 10 hours of furnace operation starting with an indoor temperature of 70° and the indicated outdoor and lower mass temperatures. It is assumed that the outdoor temperature remains constant at the figure indicated.

For example consider the two cases described below.

Case I

At start of furnace operation:	
Indoor temperature	70°
Outdoor temperature	0°
Lower mass temperature	70°
At the end of ten hours:	
Indoor temperature	61°

Case II

At start of furnace operation:	
Indoor temperature	70°
Outdoor temperature	0°
Lower mass temperature	90°
At the end of ten hours:	
Indoor temperature	71°

These cases illustrate clearly that the lower mass temperature is of vital importance in the determination of the indoor temperature at the end of a long period of furnace operation.

The effect of the amount of mass included in the lower mass M_2 is shown in Fig. 10. Initial conditions of 70° F inside and 0° F outside with a lower mass

(*Continued on Page 160*)

One Way to Build a Truck Mounted Furnace Cleaner

K. R. ZORNES, who operates the Zornes Furnace & Stoker Co., in Columbia, Missouri, wanted a truck mounted furnace vacuum cleaner with a big bag—he visualized the advertising value of such a cleaner parked outside a customer's house and rightly estimated that such a cleaner operating in a neighborhood probably would bring orders for cleaning, repairs, new equipment—it has. So he set out to build his own cleaner. The things he needed to know seemed endless, but by asking questions and writing letters he finally accumulated the necessary information and built the cleaner.

Mr. Zornes says he made one mistake—he mounted his cleaner in a trailer—the trailer is inconvenient to park in driveways—a truck-mounted cleaner, he says, is much easier to maneuver. Mr. Zornes says be received helpful advice from Clarage Fan Company on the size of the bag, the power of the motor, the size of the blower and piping, etc.

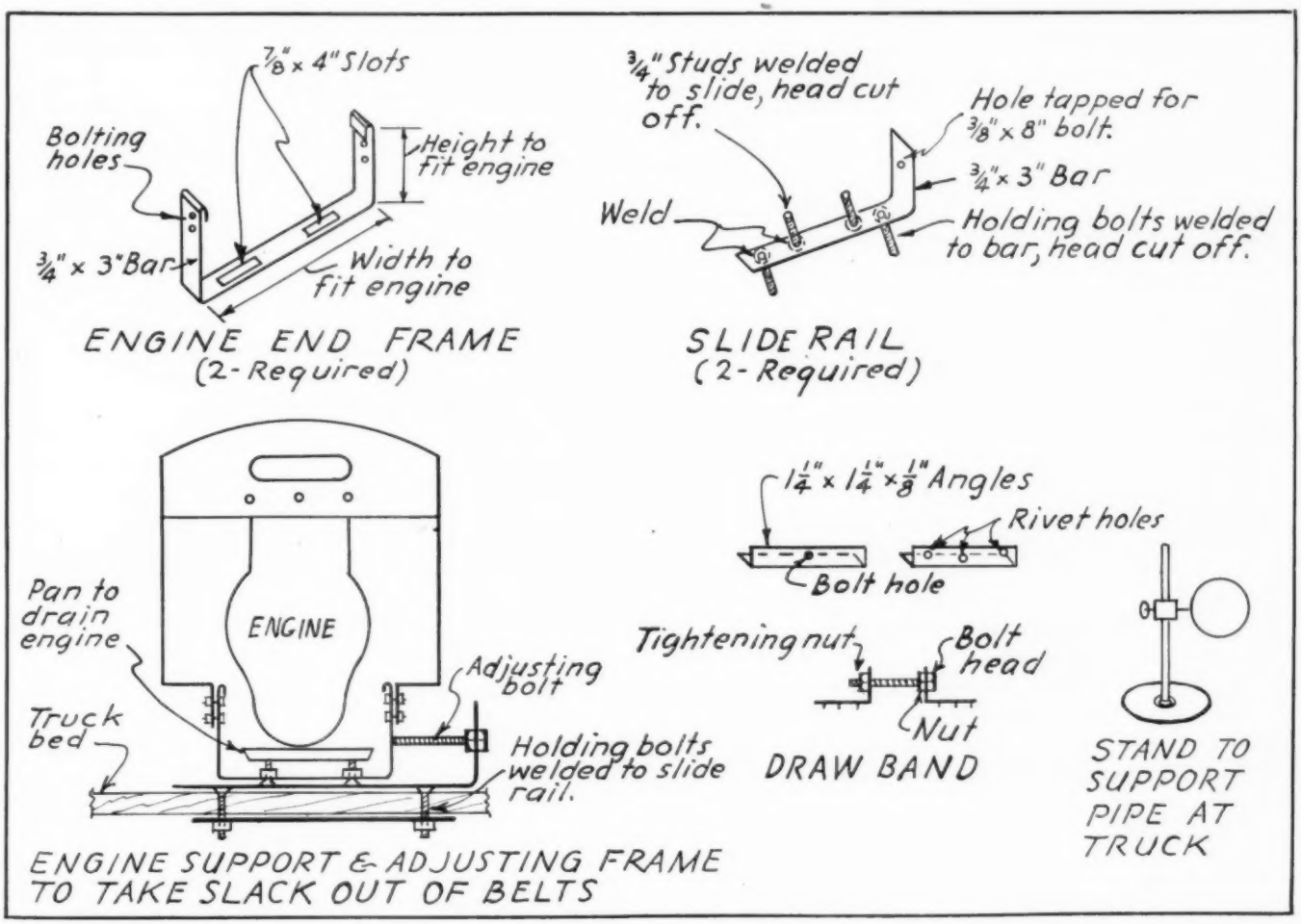
In the belief that others may be interested in building such a machine, Mr. Zornes was asked to describe his construction and show sketches of important features. This Mr. Zornes has done, and following is his description of the construction:

The Truck

While we mounted our equipment on a trailer, a truck would be much better. For the size of machine we built, a body about 16 feet long should be used. This provides plenty of space for the motor and fan, plus space for storing the bag, pipes, small cleaner and other accessories. The general arrangement of the equipment on a bed approximately 16 by 6 feet is shown in the plan.

The Fan

The fan used in this cleaner was purchased from the Clarage Fan Company of Kalamazoo, Mich. It is designated as a Type 213-LH bottom horizontal discharge, clockwise rotation, long shavings type wheel. The fan weighs 460 pounds and measures approximately 38 in. high, 40 in. wide, 35 in. deep, overall. The pulleys weigh 23 and 36 pounds. The pulley on the fan is 7.4 in. diameter for six belts; the pulley on the engine is 12.4 in. diameter, also for six belts.



The fan pulley is placed between two bearings on the mounting stand and the shaft was not keyed. We wanted a keyed shaft so that the fan pulley could be shifted slightly to align the two pulleys, so we had the shaft keyed locally.

As shown in the drawings, extra plates (½ by 3 in.) were placed under the truck bed to take the bolts from the fan base. This reduces vibration and provides a substantial bolting arrangement.

The Power Engine

To operate the fan, a 1941 Chevrolet automobile engine was taken from a wrecked car. The instrument panel was removed intact and mounted in a galvanized sheet housing attached to a framework fastened to the engine at the radiator.

The mounting of the engine to reduce vibration and to provide adjustable alignment with the fan was given special thought. Our final arrangement is shown in the drawings. The engine is cradled in a steel framework at each end using the regular motor supports. The whole framework was made just high enough to permit a shallow pan to be placed under the engine to drain the oil or catch drippings. This framework was made of ¾ by 3-in. steel bars shaped as shown in the drawings.

This engine cradle, in turn, connects to "slide rails" which permit the engine to be shifted slightly to obtain alignment with the fan. The slide rails are bolted through the truck bed. As the drawing shows, the bolt heads were cut off flush to permit moving the engine cradle. Then the bolts were welded on top side for engine framework to move. Then a hole for ¾ in. by 8 in. bolt was drilled and tapped through siderail and has a nut on the bolt to lock the position of the bolt after both bolts (at front and back of engine) have been turned equally to take the slack out of the fan belts.

The radiator for the engine is truck size and a new one, to insure adequate circulation with little air pulled through on hot days when the outside temperature is 90 to 100 deg. The engine, of course, has to operate while stationary. A six-bladed truck fan had to be used in place of the ordinary four-bladed fan.

It is a good idea to make a galvanized metal hood over the engine to keep off the sun heat. The engine exhaust can be a 2-inch metal flexible hose welded to the stud bolt plate—and with enough slack in the hose to allow shifting the motor to tighten belts. A hole about 6 in. in diameter was cut through the truck bed, and an 8-in. metal circle was fastened over this hole for insulation against fire, then a 2-in. hole was cut in the middle of the 8-in. metal circle for the exhaust flexible pipe to extend under truck bed.

On the floor near the engine, a hole was cut for easy insertion of the battery with a steel frame to fasten to under side of bed—deep enough to allow wiring to run under the bed up through the hole in bed to the starter. Ground wire was run through the bed to the motor framework.

The gas tank was mounted under the bed with the gas line passing through the bed through circles above the bed and under the engine to allow tightening of belts.

Jack Shaft for Motor Pulley

A car axle which had about a 4-in. by ½-in. plate on the end was bought at auto salvage. The axle was turned down to fit the hole in the engine pulley and the plate was trued up to fit the flywheel. Four holes were drilled to match holes in the flywheel. The axle was then cut off to proper length after it was measured so the pulley would fit close to the engine. A keyway was then cut to match the size of the pulley keyway. Bolts were used to fasten the jack-shaft to the flywheel.

I was advised this jack-shift should be long enough to allow for a bearing outside the pulley (in order to avoid excessive wear on main bearings of the Chevrolet engine) but as described above, no bearing was used to support the extreme end of jack-shaft and it has given no trouble whatever. This same jack-shaft principle is used on some makes of concrete mixers.

It is wise to build a tarpaulin framework to fit over the stake bed using about five frames for the 16-foot bed. This was made as shown in the sketch with round pins welded on frame ends and the frame ends bent down to slip into brackets fastened on the inside top end of stake bed.

The groove in the center top part of the framework is for a 2 by 2-in. by 12 ft. wood ridge pole. A 2 by 2-in. by 16 ft. wood pole was tacked to the bottom of the tarpaulin on each side for rolling up the tarpaulin to the center ridge pole.

Bag

The bag is made of 14-oz. canton flannel, water proofed on one side. About 95 yards of 34-inch material are required to make a bag 40 feet long by six feet diameter, tapered the first three feet at the fan exhaust connection, to fit a 14-in. collar sewed to the bag. We bought our flannel from Bemis Bag Co., St. Louis.

A bag 40 feet by 6 feet is preferred to one 30 feet by 5 feet because the greater area permits the air to filter through the bag when dust and lint begin to cling to the inside of the bag. Also, the larger bag, when inflated, has less buildup of air pressure which can kill the vacuum power of the machine.

Six or eight grommets were put along the big end of the bag. Sash cord was run through them to anchor the end of bag on a windy day. A 40 by 5 ft. tarpaulin may be spread under bag to protect it against wear and to keep the outside of the bag clean.

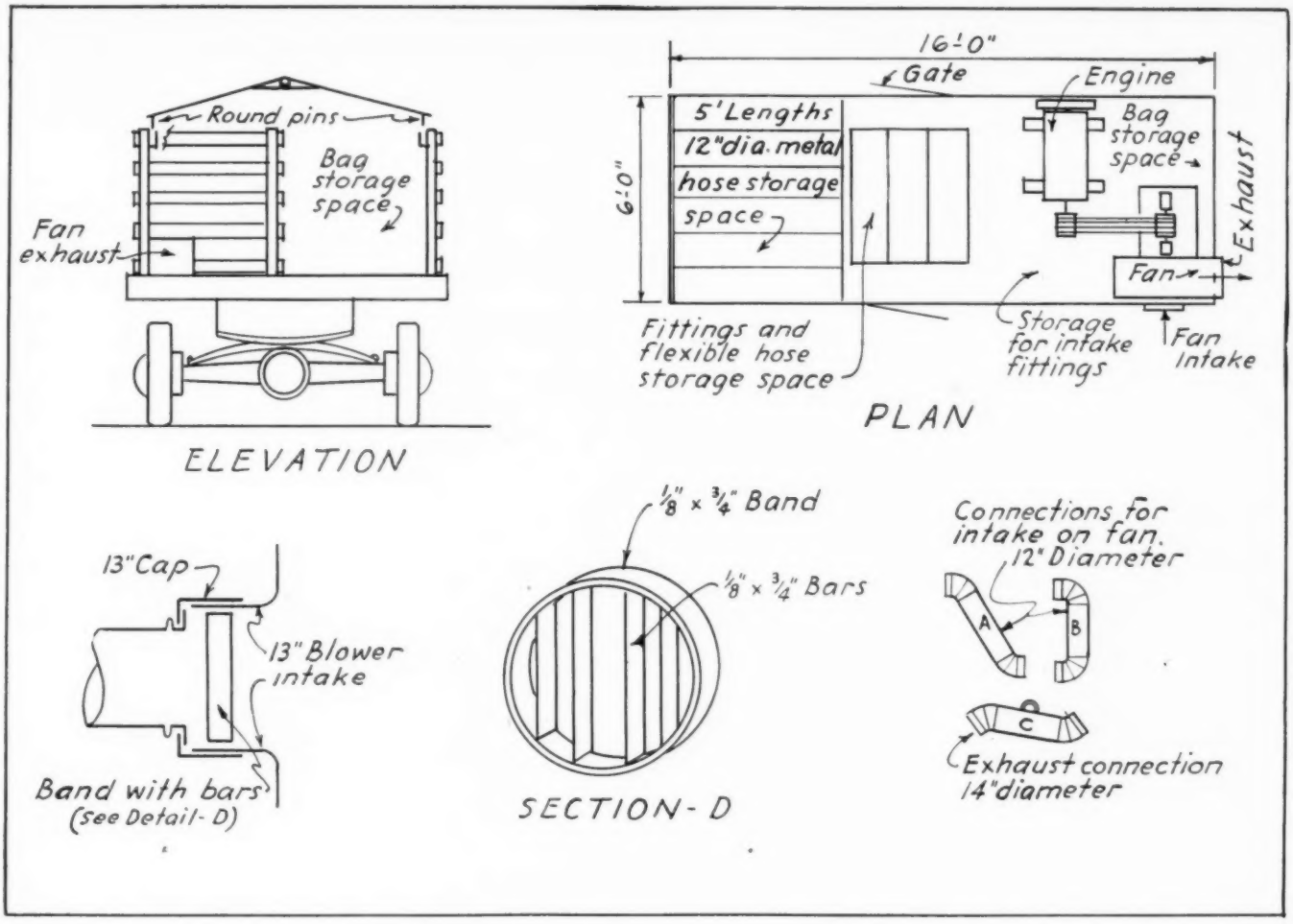
With a 40-ft. bag plus the 16-ft. truck plus the cab and exhaust connection between fan and bag, this machine has a total length of 65 feet or better.

The best way to clean the bag is to take the machine to an area where bag can be connected to machine, start the engine after rope in grommets has been loosened, and blow the bag out with engine power. Caution: You will have a *dust storm.*

The bag is not easily torn, but should it get snagged, some scraps of canton flannel and a tube of air-plane glue make a quick repair.

Fan-Bag Connection

A short boot connection is required at the fan exhaust. Diagram C shows two 14-in. galvanized angles



(60 deg.) soldered to a length of 14-in. pipe; the straight section should be long enough to clamp one 60 deg. angle to the boot connection and the opposite 60 deg. angle to the bag which usually rests in the center of the driveway.

An eye bolt should be fastened on the straight section between angles. Then a 5/16 in. rod fastens to the top of the stake bed—and swings outward and down with hook on end to fasten in eye bolt—this holds the exhaust pipe and the bag in alignment when the bag is inflated.

Connections for Intake on Fan

The Clarage fan has a 13-in. intake and so could be used with a 13-in. pipe connection—but because some basement windows are rather low, a 12-in. pipe is used. A cap 13 in. in diameter (similar to a tee-joint cap), with a 12-in. diameter collar dovetailed into the 13-in. cap and soldered makes the connection. Then a 1/8 x 3/4-in. flat steel band made to fit inside the 13-in. fan collar and having 4 1/8 by 3/4-in. bars inside the 13-in. diameter band forms a guard or grille in fan collar to catch any large obstruction before it enters the fan and injures the blades or throws them off balance. The fan guard is shown in a detail.

Setting Up To Operate

For jobs where the hose can be run into the basement from the fan side of the truck, a band can be made to fit loosely around the lower 60 degree angle in the fan-bag line. A lug welded to the band and with a hole large enough for a 5/16-in. rod to slide through, plus a thumb screw placed in lug, keeps the pipe line about 12 inches off the ground. This rod should be 24 to 30 inches long and is welded to a cast iron or steel base 8 to 12 in. in diameter. When the thumb screw is tightened on the rod at any desired point, the pipe is held in position and there is no strain on the fan collar.

For jobs where the hose has to run into the basement from the side opposite the fan, a pipe line as shown in Fig. B, with a drawband on both ends and clamps for the fan collar and lower elbow is low enough to go under truck bed or around and under fan exhaust connection.

Pipe sections A and B should have drawbands on both ends, all other pipe or flexible hose connections have a drawband on one end only.

Drawband plates were made from 1/8-in. by 1 1/4-in. angle iron. Since the drawbands are 5 inches wide, the angle iron was cut 4 3/4 inches in length (corners ground on emery) and 3 holes were drilled to rivet the angle to the drawband proper. In the other angle and in the center a hole was drilled for a 3/8-in. bolt. The bolts were threaded to the head and an extra nut was tightened next to the plate at head end to hold bolt rigid. A ratchet wrench was used for quick connection or disconnection of the hose or fittings.

Finally, a 24-gauge drawband about 5 inches wide plus an extra 1/2-inch stiffening hem turned under on

each edge and riveted with three rivets—two of these rivets will be 90 deg. each way from drawband bolt and third rivet will be 180 deg. from bolt. Between the two extreme rivets where the drawband fits the joint and also around collar where it meets joints, all joints and elbows or angles were made air tight with solder to hold strong vacuum power.

Pipe Sections

All hose pipe and fittings were made of 24-gauge galvanized iron and swedged three or four places back from each end on pipe joints to stiffen the ends for drawbands to fit around the end.

Joints or sections of galvanized pipe were cut for 12-in. net diameter from 30-in. width, 24-gauge galvanized iron. Then a ¼-in. hem was turned back on the outside part of the 30-inch width, leaving a 29-inch net length joint when put together. This ½-in. hem on the outside of the joint avoids sharp ends and stiffens the end. The first swedge was made 2 inches back from each end of the joint; next swedge as deep as the throat of a combination machine will take (about 8 inches) then two more swedges were made between the 2-inch and 8-inch swedges, to provide 4 swedges on each end of each joint.

Two joints were next placed end to end, and the distance between the two (2 inch) swedges was accurately measured. Next a band approximately 4 inches wide, plus 1 inch extra for hems, was cut and the hems turned under to stiffen the completed ends. This band is slightly larger than 12-in. diameter to go over the ends of the joints. The band is then riveted in three or four places to the end of one joint.

We have found it advantageous to have the following fittings extra:

One 12-inch elbow (90 deg.) with drawband on one end;
one 12-inch angle (60 deg.) with drawband on one end;
one 12-inch angle (30 deg.) with drawband on one end;
two 12-inch joints 29 in. long with drawband on one end;
two 12-inch joints 15 in. long with drawband on one end;
one 12-inch collar 8 in. to fit in casing (no drawband);
one 12-inch collar 15 in. to fit in casing (no drawband).

All these collars have ½-inch stiffening lap and are swedged.

Cleaning Procedure

In cleaning a casing or cold air boot, a hole is cut just large enough to fit these collars snug. After the cleaning is done, the hole is closed with a 15-in. circle of metal cut to cover the 12-in. hole in casing or cold air boot and fastened on with four metal screws and sealed with 2-in. asbestos stripping torn in 5 or 6-in. lengths.

To get through the basement window and down to the floor, rubber flexible hose lengths which will bend 90 deg. or more and will also make S curves or bends to connect to casing or cold air boots are helpful. About six lengths of 12-inch rubber flexible furnace cleaning hose four or five feet long can be purchased through Goodyear Rubber Co., and a drawband made to fasten on one end.

Flexible galvanized lengths may also be made by making tapering sections about 8 inches long with one small end 12 inches in diameter and the opposite end 13 or 13½-in. diameter plus about ¼-inch for a stiffening hem on each end. Enough of these sections should be provided so when bolted together they will bend 90 degrees. Then bolt a 12-in. collar into each end with a drawband fastened on one end. Then make a cloth tube covering (a little larger than the 13 or 13½-in, galvanized tapered sections) with the length of tube having allowance enough to let the completed flexible section bend 90 degrees. Fasten cloth tube to each end with strap drawband. A 12-in. tapered end can be fastened into a 12½-in. end by using two bolts and a piece of ¼-in. copper tubing for spacers between the two diameters—the bolt going through the copper tube spacer. On every other tapered section, the bolts should be placed in vertical position—on sections between these, the bolts should be placed horizontal. This placing of bolts allows for some more spiraling of the completed flexible section or S curving.

By adjusting the gas throttle on the panel board, speed can be increased or decreased as desired. The throttle should be marked when the proper or sufficient vacuum is determined.

The engine should be started at slow speed, then gradually speeded up to proper RPM. Shutting off engine should be done by slowing down gradually to avoid shearing off belts and loosening supports.

Generator

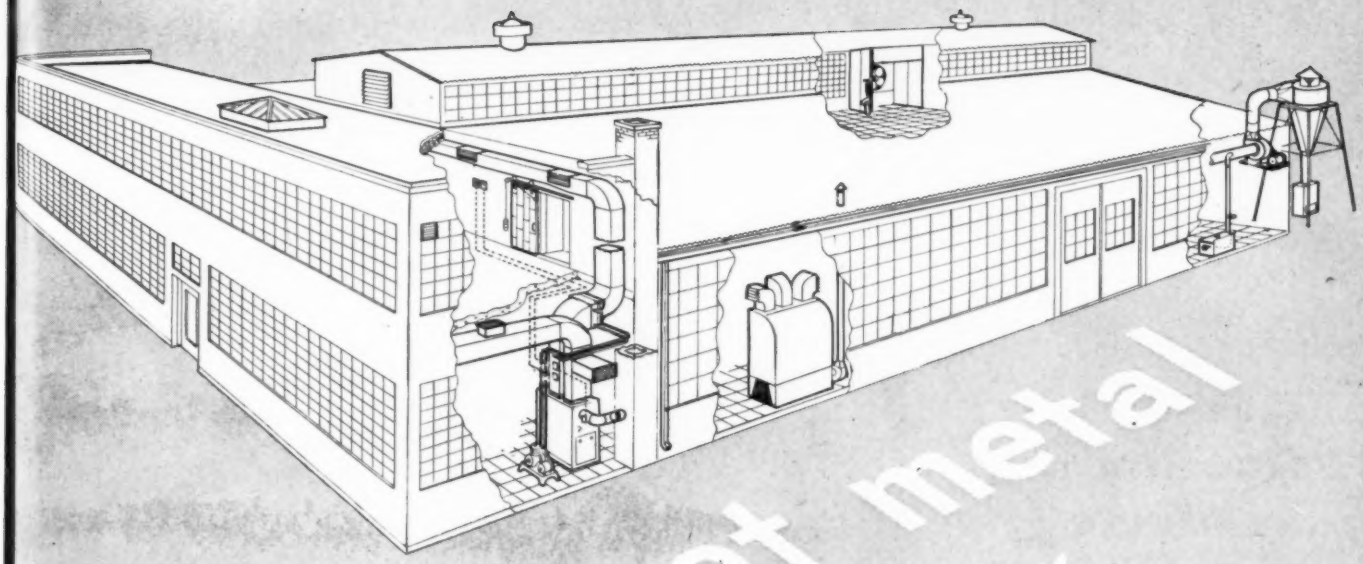
The speed of the engine may be so slow that some type generators do not get up sufficient speed to charge the battery. In such a case, it is necessary to put on a different type of generator which begins charging sooner.

Blower for Furnace Pipes

While the big machine is operating, we cover all warm and cold air faces with newspaper to hold vacuum in pipes. Then we take a two-motor, double suction furnace cleaning machine with a 12-foot metal flexible 2-in. hose attached to each motor and blow down each pipe, pushing the entire 12-ft. length of hose into the pipe. We brush off the dust in the register box and elbow—sometimes using a putty knife between box and elbow lap and a whisk broom for brushing register dust into the pipe opening. The big machine pulls this dust away immediately.

During this operation, we do not uncover any register or grille until we are ready to clean it and when finished we replace the cover, using newspaper. By using two motors for blowing by two men on registers and pipes, we speed up the work. We never open up two return air grilles at the same time as this will disturb the power of the big machine too much.

On a two-joist flat sheeted cold air, it is best to keep one grille space covered while the other space is cleaned; then cover the other half and clean the first space.



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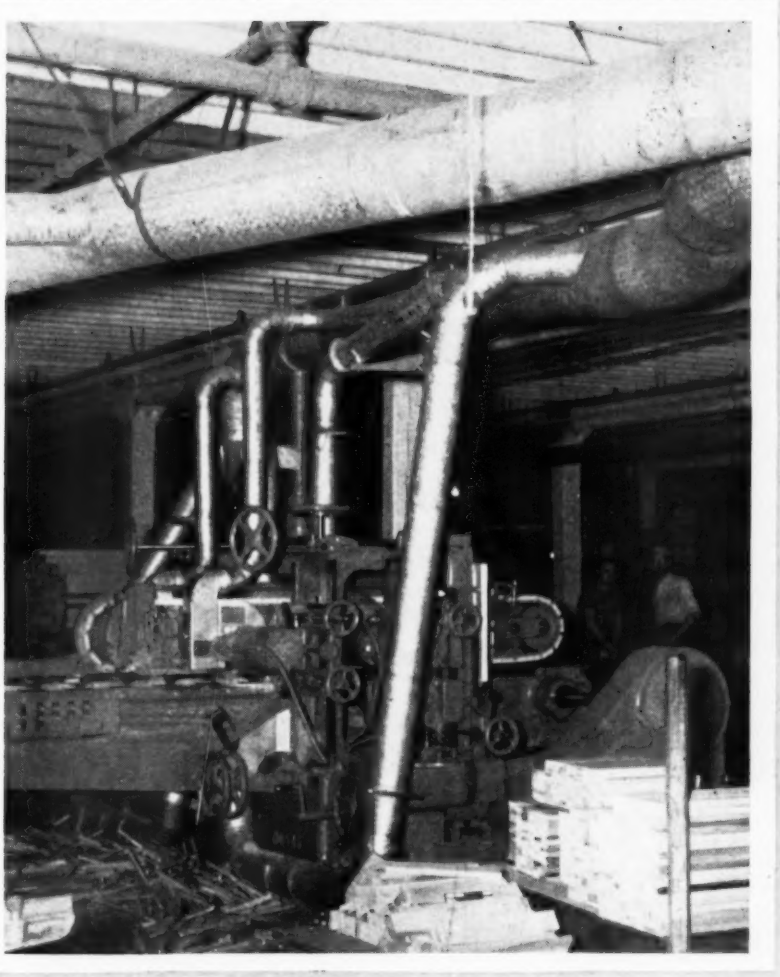

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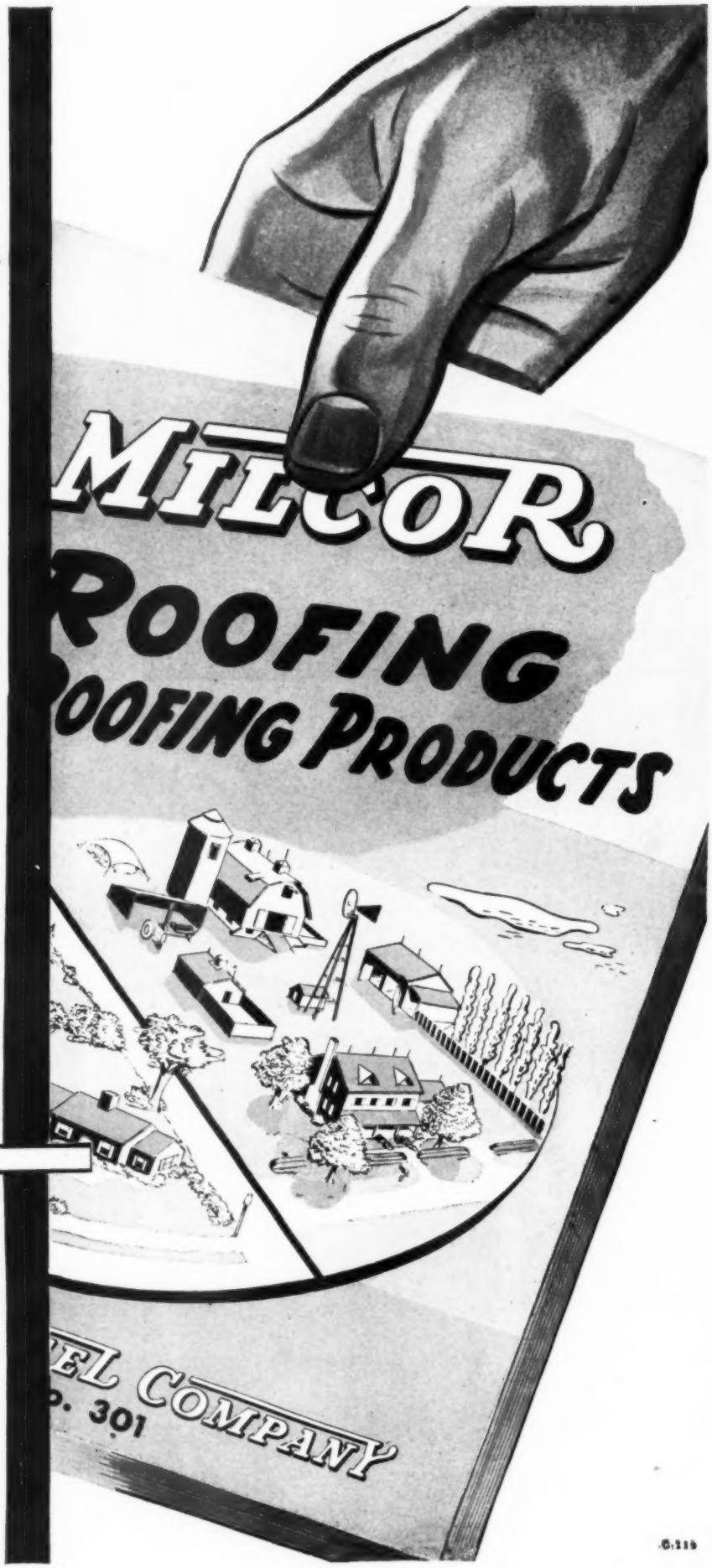

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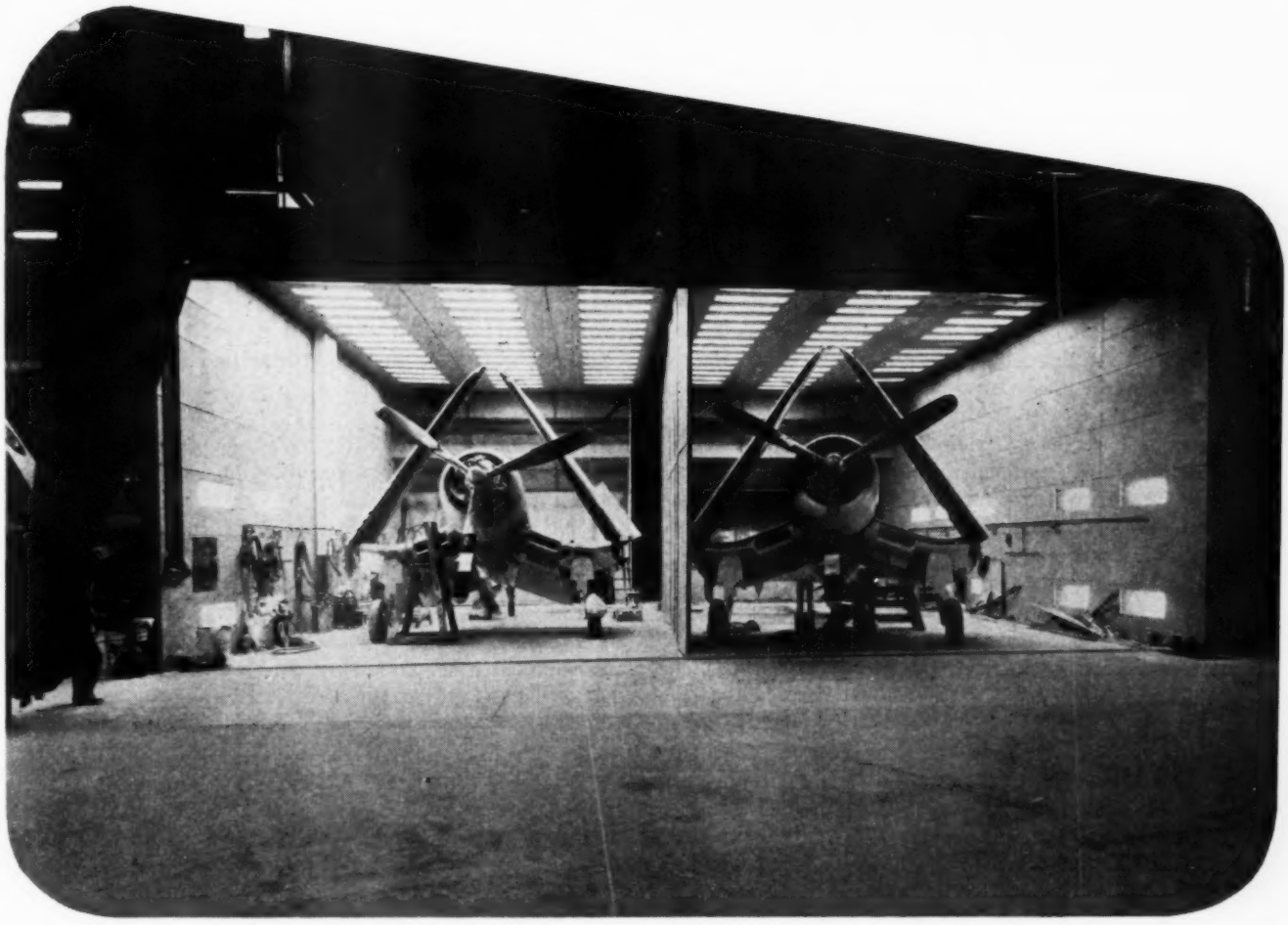


Ventilation For Spray Painting

Allen D. Brandt, Sc.D.*

BEFORE the advent of spray painting the painters' trade was unhealthful above the average as evidenced by the records of industrial insurance companies in this country and of the state sickness insurance bureaus of other countries. This was due to the poisonous nature of many paint pigments and vehicles, and the careless personal habits of the painters. The obvious remedy was to substitute less harmful pigments where possible and to improve hygiene. These measures have been used with increasing success during the past 25 years. During this same period, however, changes have been taking place in painting procedures and paint ingredients which have counteracted to a considerable extent the reduction in the health hazard attributable to safer pigments and better hygiene. Thus spray painting has been replacing brush painting, and lacquers and resins with more toxic liquid vehicles are used at an increasing rate to replace the oil paints so common prior to the spray painting era.

Formerly Sanitary Engineer, Industrial Hygiene Division, U. S. Public Health Service.

It is not difficult to visualize the increased amount of paint pigment and thinner which escapes into the air near spray painting operations as compared with brush painting. While most pigments and other solid paint ingredients with the exception of lead oxide, a common metal primer, are not particularly toxic, many of the solvents and diluents such as the aromatics (benzene, toluene, and xylene) and the alcohols, esters, ethers and ketones are quite toxic. Other liquid vehicles, the paraffins and naphthenes (gasoline, Stoddard solvent, petroleum naphtha, V.M.&P. naphtha, and the like) are comparatively less toxic, but they are by no means harmless. It is apparent, therefore, that spray painting presents a potentially important health hazard.

Controlling the Health Hazard in Spray Painting

Ventilation is probably the most important method for controlling the health hazards created by spray painting. The ventilation rate and the design of the hood or enclosure are influenced largely by the nature of the operation. From the control viewpoint spray painting operations may be classified conveniently into

the following types:

1. Automatic
2. Manual spraying of small objects in a booth
3. Manual spraying of large objects in a booth
4. Manual spraying in a confined area
5. Manual spraying in an unconfined space

Automatic spraying operations: Such operations do not present much of a problem as a rule. Spray painting of small and regular production items can sometimes be accomplished in booths or hoods which are closed almost completely. The parts to be painted are fed onto suitable supports or jigs on a rotating table or straight-line conveyor by hand or mechanically, and are painted as they pass through the hood by means of one or a number of guns which spray continuously or are tripped by the object as it enters the proper position for painting. The guns may be so directed that they cover the entire surface of the object as it passes through, or the object may be rotated by a secondary mechanism as it enters the painting zone. Since the hood or booth can enclose the painting operation almost completely the exhaust ventilation rate need not be very high to effect good control. In fact, even with the exhaust rate computed on the basis of 200 cfm per square foot of opening into the booth (adequate to prevent the escape of paint mist or vapor) the total rate of ventilation for an enclosing hood or booth may be too low to reduce the vapor concentration below the explosive limit in the exhaust duct. Thus with a well-designed hood enclosing an automatic spray painter, it is not unlikely that the total area of opening to the outside will be less than two square feet, requiring an exhaust rate of only 400 cfm to prevent the escape of mist and vapor. However, if the painting rate is, for example, three pints per minute and the liquid vehicle is acetone, it may be seen from table 1 that 795 cfm will be needed to keep the concentration of vapor in the rear end of the booth and in the exhaust duct below the explosive limit; an important consideration from the fire safety viewpoint.

Dilution rates for explosion safety for solvents and diluents not given in table 1 may be computed by:

$$Q = \frac{41{,}000 \times \text{SpGr}}{\text{MW} \times \text{LEL}} \qquad \text{(I)}$$

Where Q is the required dilution rate in cubic feet of air per pint of liquid.

SpGr is the specific gravity of the liquid (water = 1)

MW is the molecular weight of the liquid in grams.

LEL is the lower explosive limit of the liquid in % by volume.

For health the following equation applies:

$$Q = \frac{4.1 \times 10^{8} \times \text{SpGr}}{\text{MW} \times \text{MAC}} \qquad \text{(II)}$$

Where Q, SpGr and MW are the same as in I and

MAC is the maximum allowable concentration of the paint liquid in parts of substance per million parts of air.

Table 1
Data on Common Paint Solvents and Diluents

Name	M.W.	Sp. Gr.	MAC*	LEL**	Dilution rate in cfm per pint from standpoint of Health	Explosion
Acetone	58	0.79	500	2.1%	11,500	265
Amyl acetate	130	0.87	200	1.1%	13,000	250
Amyl alcohol	88	0.82	100	1.2%	39,000	320
Benzol (benzene)	78	0.88	100	1.4%	47,000	330
Butyl acetate	116	0.88	200	1.7%	15,000	180
Butyl alcohol	74	0.81	50	1.7%	91,000	265
Butyl cellosolve	118	0.90	200	....	16,000	...
Cellosolve	90	0.93	200	2.6%	21,500	165
Cellosolve acetate	132	0.97	100	1.7%	30,500	180
Cyclohexanol	100	0.96	100	....	40,000	...
Cyclohexanone	98	0.95	100	....	40,000	...
Dioxane	88	1.04	500	....	10,000	...
Ethyl acetate	88	0.90	400	2.2%	10,500	190
Ethyl alcohol	46	0.79	1000	3.3%	7,000	210
Isopropyl acetate	102	0.87	200	2.0%	17,500	175
Isopropyl alcohol	60	0.79	400	2.5%	14,000	215
Methyl acetate	74	0.96	100	4.1%	54,000	130
Methyl alcohol	34	0.80	200	6.0%	51,500	160
Methyl cellosolve	76	0.97	100	....	52,500	...
Methyl ethyl ketone	72	0.81	200	1.8%	23,000	255
Methyl isobutyl ketone	100	0.80	200	....	16,500	...
Petroleum ether	72	0.63	500	1.4%	7,200	255
Propyl acetate	110	0.75	200	2.0%	14,000	140
Stoddard solvent	130	0.80	500	1.1%	5,000	240
Toluol (toluene)	92	0.87	200	1.3%	19,500	300
Turpentine	136	0.87	100	0.8%	26,000	325
VM&P naphtha	110	0.75	500	1.2%	5,600	235
Xylol (xylene)	106	0.88	200	1.0%	17,000	340

** Approximate maximum allowable concentration in parts of substance per million parts of air by volume.*
*** Lower explosive limit in percent by volume.*

The sample calculation given above over-simplifies the problem, but it is sufficiently accurate for most practical purposes. Usually a factor of safety should be added even though a small one is automatically included in that the liquid vehicle seldom is a single liquid and it never is 100% of the paint. From the approximate composition of lacquers shown in table 2 it is apparent that an automatic safety factor of almost 2 was included in the example. Since automatic spraying machines, as a rule, require relatively small exhaust rates, it is wise to employ a larger factor than is included in the sample calculation. One other very important item which should not be overlooked is the peak rate of spraying. For instance, if the average rate of paint consumption is three pints per minute as given above, but the spraying operation is intermittent, that is, the guns are tripped by the object to be sprayed, the peak rate of paint consumption is the average rate divided by the percentage of time the spray guns are actually at work. In such cases the peak rate must be utilized in the calculation of the minimum exhaust rate to prevent the creation of explosive mixtures in the exhaust duct.

Table 2
Approximate Composition of Lacquers

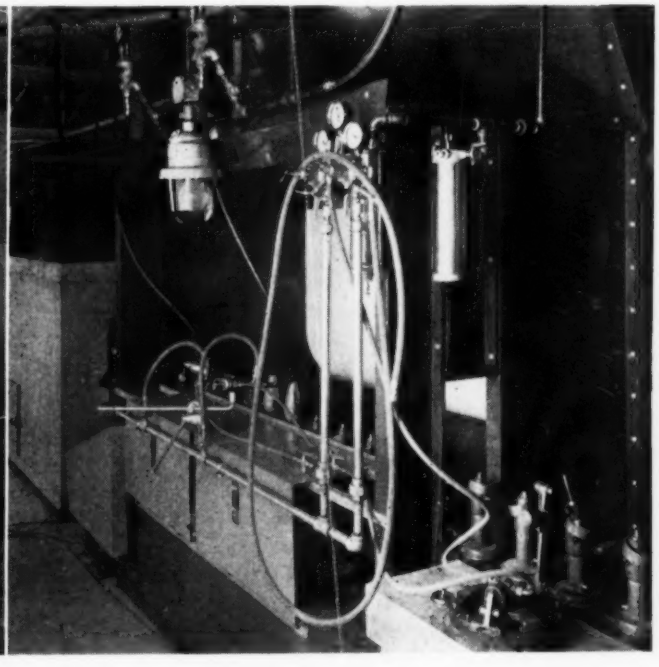
Ingredient	Percentage	
Solvent	45	Volatile fraction 75%
Diluent	30	
Nitrocellulose	10-12	Non-volatile fraction 25%
Gums-Resins	5	
Plasticizers	5	
Pigment	3	

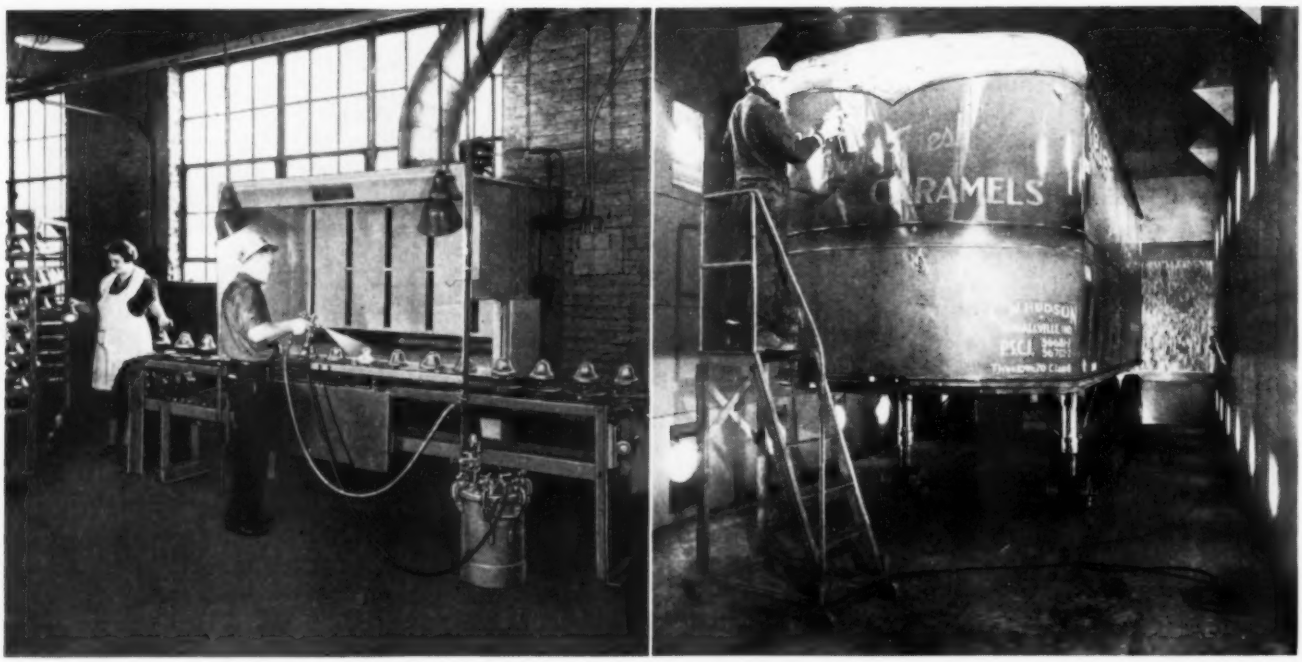
Manual spraying of small objects in a booth: Bench type booths having face areas of about 2 x 2 feet and larger are in common use for hand painting of small objects of all kinds. The recommended minimum exhaust rate to prevent the escape of sufficient mist and vapor to be harmful to the operator is 200 cfm per square foot of hood opening. This rate of ventilation will be very effective if the object to be sprayed is located within the confines of the hood and at arm's length or more from the operator. If the object to be coated is rotated or manipulated by hand while spraying is in progress, a higher rate may be needed to keep the rebounding mist from reaching the painter. If the objects cannot be located within the booth for painting, they should be painted in a larger booth. For infrequent and unusual instances of this type the operator can be protected by a suitable respirator and the hood will serve to remove most of the paint mist, thereby preventing discoloration of nearby objects and walls.

Manual spraying of large objects in a booth: Large open booths are probably the most common of all. The objects to be coated may be moved into and out of the booth manually, or by crane, truck or conveyor. They may be located on the floor, on benches, on jigs, or suspended from overhead hooks for spraying. Sometimes where conveyors are used to transport the objects through the booth, the spraying is done automatically by fixed guns. However as long as the face is open to permit ready admittance of workers, the recommended minimum ventilation rate is the same as for booths in which the painting is done manually. The required minimum exhaust ventilation rate is 150 cfm per square foot of face opening for most jobs and 200 cfm if highly toxic materials are used.

It is apparent that the total quantity rate of exhaust for booths may reach high figures (7800 cfm for a booth with a 6½ x 8-foot face) and frequently produces a heating problem. It must not be forgotten that if this volume of air is exhausted per minute a

In the illustrations below are shown an automatic spraying booth in operation and a booth set up for manual spraying of small objects on a conveyor line.





Above is shown another booth for manual spraying of automatically conveyed articles. On the right is an excellent example of manual spraying of large objects in a booth.

similar amount must be supplied, and it must be heated to about room temperature in cold weather. This raises the question of partial recirculation of the exhausted air. It must be stated at the outset that recirculation of air from spray booths is a very uncommon practice and is fraught with danger. It is advisable only in rare instances where (1) the ventilation rate produces a costly heating problem, (2) the pigment is nontoxic and is removed in part by water curtains or other filtering procedures, (3) the spraying operations are such as to produce relatively low concentrations of solvent or diluent vapor in the exhaust air, and (4) there is no possibility that a more toxic paint will be substituted for that for which the system is designed.

Table 3
Maximum Percentage of Recirculation Permissible

Dilution Rate* Booth Ventilation Rate (R)	Maximum percentage of recirculation permissible
3	25
2	33
1.5	40
1	50
0.75	57
0.50	67
0.25	80

* *Dilution rate in cfm from table* 1 *or equation II.*

Assuming for instance, that an installation which meets the foregoing requirements is under consideration, what is the maximum percent of the air passing through the booth that may be recirculated safely, that is, without having the vapor concentration in the air entering the booth exceed the maximum allowable concentration? This value may be determined easily from table 3 or from the following equation:

$$P = \frac{100}{R + 1} \qquad \text{(III)}$$

Where P is the maximum percentage of air which may be recirculated.

R is the ratio of the air required for dilution (table 1) to that required for booth ventilation.

For example, what will be the maximum percentage of recirculation permissible at a spray painting operation conducted in a 6 x 6½-foot booth where an amyl acetate paint is used at a fairly uniform rate of one quart every three minutes. From table 1, the dilution rate is 8700 cfm (0.67 pint per minute) and the recommended booth ventilation rate is 5850 cfm (6 x 6½ x 150). The ratio of the dilution to the ventilation rate (R) is 1.49, and from equation III the maximum percentage of recirculation is found to be 40%. For this example table 3 might have been used conveniently.

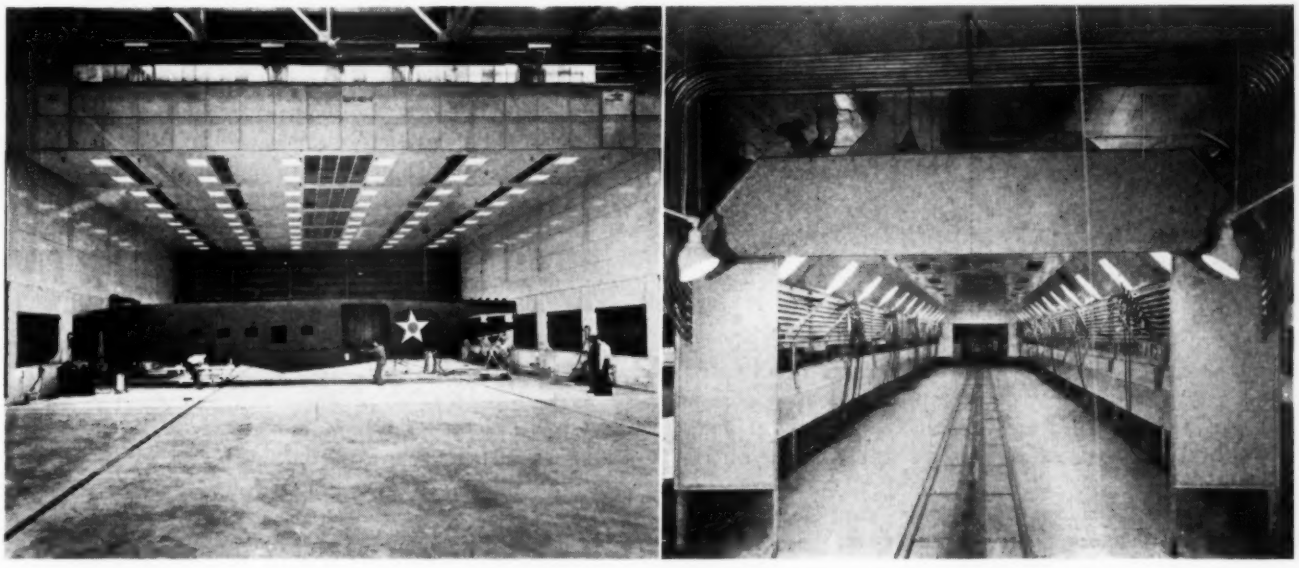
To get a clearer idea of what would take place in the foregoing example, let us check the results. For this purpose it is necessary to consider the air-flow rate and the vapor concentration at three points; in the discharge stack, in the recirculation duct, and at the entrance to the booth. With a recirculation rate of 40%, only 60% of the air passing through the booth or 3510 cfm will be discharged to the outside. Obviously when conditions have attained equilibrium the vapor will be carried away at the same rate it is produced, hence, the 0.67 pint per minute of amyl acetate will be carried away by 3510 cfm of air. The concentration of vapor in the discharge air will be 495 ppm $\left[\frac{(8700 \times 200)}{3510}\right]$. The recirculated air (2340 cfm), obviously, contains the same concentration of vapor. Since it is mixed with 3510 cfm of uncontaminated

air from the room in which the booth is located, the resulting concentration of vapor in the air entering the booth is 198 ppm $\left[\frac{(2340 \times 495 + 3510 \times 0)}{5850}\right]$ which does not exceed the maximum allowable concentration of 200 ppm for amyl acetate.

The recirculation rate actually used should never be as high as the maximum allowable; a factor of safety of at least 1½ or 2 should be used. Under no circumstances should more than one-half the air be recirculated, and no recirculation should be permitted if the paint contains a toxic pigment or solid, or a very toxic solvent such as benzol or toluol. One other word of warning in connection with recirculating air from spray booths is that the actual or peak spraying rate frequently will be much higher than the average rate; a factor which must be taken into consideration when calculating maximum permissible recirculation rate.

Manual spraying in a confined area: Trucks, buses, railroad cars, and airplane sections are often spray painted in booths, rooms or other enclosures large enough to accommodate them. There is little uniformity in the procedure or in the control measures employed from place to place. In most cases, however, the ventilation rate is not adequate to protect the sprayer completely. The ventilation is provided mostly to prevent contaminating the other nearby spaces, to protect the workers other than the sprayers within the enclosure and to avoid a fire hazard. A very common exhaust rate is 15 to 30 air changes per hour. The sprayers wear air-line or chemical cartridge respirators while spraying. Where the enclosure is not too large in cross-sectional area but relatively long, a common procedure is to design the ventilating system on the basis of 100 to 150 cfm per square foot of cross-sectional area. Even in such cases the sprayer needs respiratory protection when he is located downwind of the object or surface he is spraying. The author has seen one very effective arrangement for painting war tanks. The booth was closed on four sides and open above. The floor was of steel grid construction through which the air was exhausted. The ventilation rate was about 75 cfm per square foot of horizontal cross-sectional area when no tank was in the booth. The actual downward air velocity with a tank in the booth was about 150 fpm which provided a fair degree of control as long as the sprayer made it a practice of keeping his face well above the part being sprayed.

Manual spraying in an unconfined space: If spray painting is done in large unconfined spaces or in the open, for example, spraying large cylindrical water and air tanks and sections of fabricated steel construction, the sprayer can rarely be protected by ventilation alone. General ventilation is necessary to keep the average atmosphere vapor concentration well below the maximum allowable concentration but the persons who are doing the spraying need air-line or chemical cartridge respirators to protect them from the high vapor, mist and pigment concentration in the air which they breathe. The minimum required general ventilation may be determined from table 1 or equation II if the rate of paint consumption is known. Good air circulation in the area where the painting is done keeps the degree of atmosphere contamination uniformly low over the entire area.



The photo on the left shows as large a job of product spraying as there is in existence, probably, and the setup at the right is a very effective automatic spraying system for large objects.

Drying Painted Articles

It is a not infrequent practice to provide a properly ventilated booth for spraying parts and ignore entirely the vapors given off by the painted articles in drying after they have left the booth. Unless the finished parts are dry before they leave the confines of the booth they should be stored in an exhaust ventilated room for drying, or they should pass through an ex-

haust ventilated tunnel for this purpose. The ventilation rate is not critical except that there should be an inward flow of air through all openings, and faster drying is accomplished, as a rule, with higher ventilation rates. Under no circumstances should heated air be forced through a drying tunnel and then wasted into the room. The same drying efficiency can be obtained by reversing the direction of air flow and discharging the contaminated air to the outside.

Notes on Construction

To effect uniform distribution of air currents in some spray booths it is necessary to install one or more baffles across the booth near the outlet, otherwise certain sections of the booth will be by-passed owing to the usual abrupt and relatively small inlet to the fan. In addition to distributing the air currents, baffles act as impingement plates for the collection of waste paint droplets and mist, thereby reducing the amount reaching the fan and adhering to the blades. This is not nearly so important with water curtain type booths as with the more common design. Paint on the fan blades reduces its efficiency, increases the maintenance problem and the fire hazard, and if it gets in the duct it increases the resistance to air flow. The baffles should be mounted firmly but detachably to simplify cleaning operations.

In most exhaust systems for spray painting the fan and duct system are simple. The duct length is short and due to the low transport velocity required (about 2000 fpm) the resistance is very low. This permits the use of propeller fans which can be mounted directly in the duct. The motor, however, should be located outside the duct. Inspection and cleanout openings are required near the fan, at duct bends and at sufficient intermediate locations to permit periodic cleaning.

In those rare instances where long ducts or discharge stacks cannot be avoided a centrifugal fan may be required to operate satisfactorily, and it may then be economical to use a smaller diameter duct and a higher duct velocity.

The air exhausted from spray painting operations should be discharged at a point not less than six feet above the roof and as far from windows, doors and other buildings as practicable. Even if water curtain booths or other cleaning devices are used the air should be discharged at an appropriate place because the common cleaning devices do not remove any of the vapor, and only part of the mist and pigment.

Fire Prevention

Detailed recommendations for fire resistant construction are contained in National Board of Fire Underwriters Pamphlet No. 33. Some of the more important design requirements for fire prevention are:

1. Construct booth, floor, and baffles of fire resistive materials.
2. Construct inner walls, ceiling, floor and baffles of spray booths with smooth surfaces, and establish a routine program of cleaning for all parts of the ventilating system.
3. Provide fans with non-ferrous blades.
4. Do not locate any switches, motor starters, or other sparking devices inside booths, nor the fan motor in the duct.
5. Use only vapor proof lamps for lighting inside the booth.
6. Store supplies of spray material and thinner, and conduct all mixing operations, in a well-ventilated fireproof building.

In closing, the following "cook book" rules are offered as a guide in the proper construction, operation, and maintenance of exhaust ventilating systems for spray painting:

1. If the painting is done manually, educate the painter to stand upwind of the object being painted and as far from it as is consistent with good operation.
2. Wherever possible, support the objects to be painted on rotating jigs, turntables, or swivel-hooks to permit the painter to stay as far from the objects as possible.
3. Use as low pressure as practicable on the spray gun to keep the paint from rebounding to the worker.
4. On large work, provide suitable platforms or scaffolds so that all surfaces can be reached conveniently with minimum spray gun pressure.
5. Use paints which contain only less toxic solvents, diluents and solids.
6. Guard against changes in paint composition unless it can be demonstrated that the substitute product is not more toxic than the original.
7. Use the proper exhaust ventilation rate and check it frequently to be sure that this rate is being maintained.
8. Use booths large enough to accommodate the articles to be painted.
9. Guard against explosive mixtures in the exhaust ducts of enclosed automatic spray painting equipment.
10. Provide inspection and clean-out doors in the duct at intervals which will permit convenient cleaning of all interior surfaces.
11. Establish an adequate and thorough cleaning schedule and make one individual (preferably not the painters) responsible for the condition of the booth and exhaust system.
12. Discharge the exhausted air at a point which will not create a nuisance or health hazard.
13. Provide an exhaust-ventilated tunnel, cabinet or room for drying the painted articles unless they remain in the booth long enough to dry thoroughly.
14. If the painting operation is one which prevents the painter from remaining in the clean air while painting, provide him with an air-line or chemical-cartridge respirator and educate him to wear it at all times while spray painting.
15. Never recirculate air exhausted from a spray painting booth unless it can be shown to be safe, and only if discharging it all to the outside will create a difficult heating problem.
16. Do not locate the fan motor in the duct.
17. Use fans which have non-ferrous blades.
18. Avoid cross air currents at the face of the booth from nearby open doors.

Pipe and Duct Sizing Charts For Cfm's From 30 to 80,000 [Part III]

IN the March issue, two Tables (A and B) and in the April issue three Tables (C, D, E) of this series were published. In this issue the last Table—Table F—appears on this page. All of these Tables, A through F, are based upon a pipe resistance of 0.07 inches water gauge.

On the following page Table 2 is a conversion table to be used to convert sizes for frictional resistances other than 0.07. To design a duct system for resistances other than 0.07 proceed as follows: Find the resistance on which your duct system will be designed under the column titled "Inches, Water" and extend horizontally to the corresponding "multiplier." Then divide the required cfm by this multiplier to find the equivalent cfm for use in Tables A through F.

Example: the pipe size is required for 4,000 cfm at 0.04 inches resistance. Find 0.04 under the column "Inches, Water" in Table 2 and the multiplier is 0.7402. *Dividing* 4,000 by 0.7402 equals 5,404 cfm. Find 5,404 in Table C (nearest figure is 5400) and the round pipe size is 29.20 and the rectangular sizes will be 50 by 15, 41 by 18, 34 by 21, etc.

Example: The pipe size is required for 280 cfm at 0.50 inches resistance. Find 0.50 under column "Inches, Water" in Table 2 and the multiplier is 2.8779. *Dividing* 280 by 2.8779 equals 97.3. Find 97.3 in Table A (nearest figure is 100) and the round pipe size will be found to be 6.61.

Also presented below is Table 3 containing round pipe diameters, circumferences, areas in square inches and areas in square feet—a tabulation frequently of use to heating engineers.

All of these tables were originally prepared by A. M. Norris, chief air conditioning engineer of the Lloyd E. Mitchell, Inc. company of Baltimore, Md. The tables were made available to AMERICAN ARTISAN by William P. Flanigan, vice-president of the Mitchell company.

[Table F and Table No. 2 are on the following page]

TABLE 3
Equivalent Areas

Round Duct Size	Inches, Circumference	Area Sq. Ins.	Area Sq. Ft.
Inches			
1	3.1416	.7854	.0054
2	6.2832	3.1416	.0218
3	9.4248	7.0686	.0491
3½	10.996	9.6211	.0668
4	12.566	12.566	.0873
4½	14.137	15.904	.1104
5	15.708	19.635	.1364
5½	17.279	23.758	.1650
6	18.850	28.274	.1964
6½	20.420	33.183	.2304
7	21.991	38.485	.2673
7½	23.562	44.179	.3068
8	25.133	50.265	.3491
8½	26.704	56.745	.3942
9	28.274	63.617	.4418
9½	29.845	70.882	.4923
10	31.416	78.540	.5454
10½	32.987	86.590	.6010
11	34.558	95.033	.6600
11½	36.128	103.87	.7215
12	37.669	113.10	.7854
12½	39.270	122.72	.8520
13	40.841	132.73	.9218
13½	42.412	143.14	.9937
14	43.982	153.94	1.069
14½	45.553	165.13	1.146
15	47.124	176.71	1.227
15½	48.695	188.69	1.310
16	50.265	201.06	1.396
16½	51.836	213.82	1.485
17	53.407	226.98	1.576
17½	54.978	240.53	1.670
18	56.549	254.47	1.767
18½	58.119	268.80	1.867
19	59.690	283.53	1.969
19½	61.261	298.65	2.074
20	62.832	314.16	2.182
20½	64.403	330.06	2.293
21	65.973	346.36	2.405
21½	67.544	363.05	2.508
22	69.115	380.13	2.640
22½	70.686	397.61	2.761
23	72.257	415.48	2.885
23½	73.827	433.74	3.012
24	75.398	452.39	3.142
24½	76.969	471.44	3.274
25	78.540	490.87	3.409
25½	80.111	510.71	3.547
26	81.681	530.93	3.687
26½	83.252	551.55	3.832
27	84.823	572.56	3.976
27½	86.394	593.96	4.125
28	87.965	615.75	4.276
28½	89.535	637.94	4.430
29	91.106	660.52	4.587
29½	92.677	683.49	4.747
30	94.248	706.86	4.909
30½	95.819	730.62	5.074
31	97.389	754.77	5.241
31½	98.960	779.31	5.412
32	100.531	804.25	5.585
32½	102.102	829.58	5.761
33	103.673	855.30	5.940
33½	105.243	881.41	6.121
34	106.814	907.92	6.305
34½	108.385	934.82	6.492
35	109.956	962.11	6.681
35½	111.527	989.80	6.873
36	113.097	1017.9	7.069
36½	114.668	1046.3	7.266
37	116.239	1075.2	7.467
37½	117.810	1104.5	7.670
38	119.38	1134.11	7.876
38½	120.95	1164.16	8.090
39	122.52	1194.59	8.296
40	125.66	1256.64	8.727

Conversion Table
CFM To Rectangular Sizes

TABLE F
Equivalent Rectangular Duct Sizes

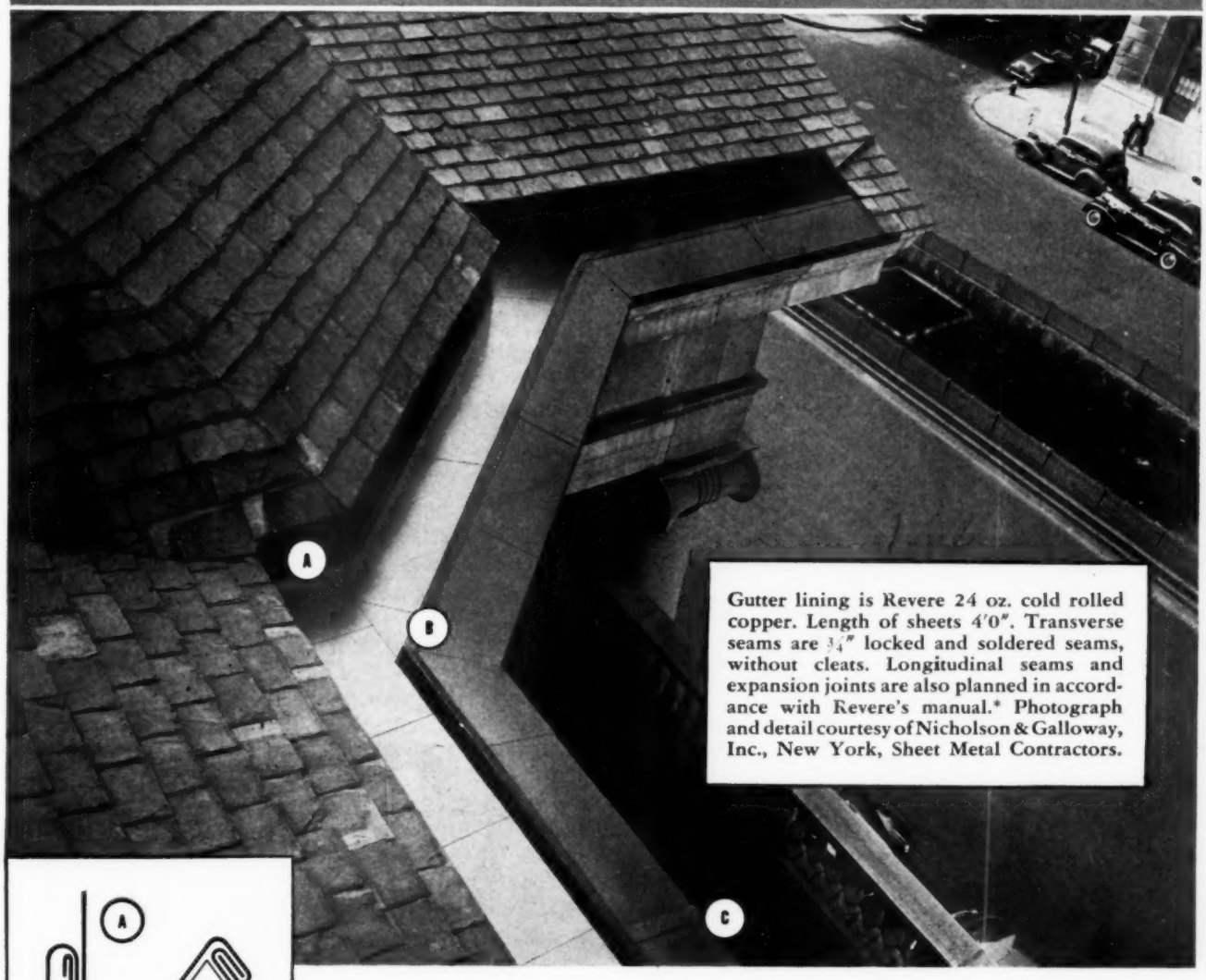
Round Duct Size Ins.	CFM	FPM	48x	54x	60x	66x	72x	78x	84x	90x	96x	Round Duct Area Sq. Ft.
63.28	43000	1969	70	62	56	51	47					21.8404
63.56	43500	1975	71	62	56	51	47					22.0341
63.84	44000	1981	71	63	57	52	48					22.2287
64.10	44500	1987	72	63	57	52	48					22.4101
64.36	45000	1993	72	64	58	52	48					22.5923
64.88	46000	2004		65	59	53	49					22.9588
65.40	47000	2015		66	59	54	50					23.3283
65.90	48000	2026		67	60	55	50					23.6864
66.40	49000	2037		68	61	56	51					24.0472
66.90	50000	2048		69	62	56	52					24.4107
67.40	51000	2058		70	63	57	53					24.7769
67.90	52000	2068		71	64	58	54					25.1459
68.38	53000	2078		72	65	59	54	50				25.5026
68.86	54000	2088		73	66	60	55	51				25.8619
69.32	55000	2098		74	66	60	56	52				26.2086
69.78	56000	2108		75	67	61	57	52				26.5576
70.24	57000	2118		76	68	62	57	53	50			26.9090
70.69	58000	2128		77	69	63	58	54	50			27.2548
71.14	59000	2137		78	70	64	59	54	51			27.6029
71.60	60000	2146		79	71	65	59	55	51			27.9610
72.04	61000	2155		80	72	66	60	56	52			28.3058
72.48	62000	2164		81	73	66	61	57	53			28.6526
72.90	63000	2173		82	74	67	61	57	53			28.9856
73.34	64000	2182		83	75	68	62	58	54	51		29.3366
73.76	65000	2191		84	76	69	63	58	54	51		29.6736
74.18	66000	2199		85	76	69	64	59	55	52		30.0124
74.60	67000	2207		86	77	70	64	60	56	52		30.3532
75.02	68000	2215		87	78	71	65	60	56	53	50	30.6960
75.44	69000	2223		88	79	72	66	61	57	53	50	31.0406
75.85	70000	2231		89	80	72	66	62	57	54	51	31.3790
76.26	71000	2239		90	81	73	67	62	58	54	51	31.7191
76.65	72000	2247		91	82	74	68	63	59	55	52	32.0443
77.04	73000	2255		92	82	75	69	63	59	55	52	32.3712
77.43	74000	2263		93	83	75	69	64	60	56	53	32.6999
77.82	75000	2271		94	84	76	70	65	60	57	53	33.0301
78.20	76000	2279		95	85	77	71	65	61	57	54	33.3535
78.57	77000	2287		96	86	78	71	66	61	58	54	33.6698
78.94	78000	2295			87	79	72	67	62	58	55	33.9876
79.31	79000	2303			87	79	73	67	62	59	55	34.3070
79.68	80000	2310			88	80	73	68	63	59	56	34.6279

Conversion Table
For Resistances Other Than 0.07

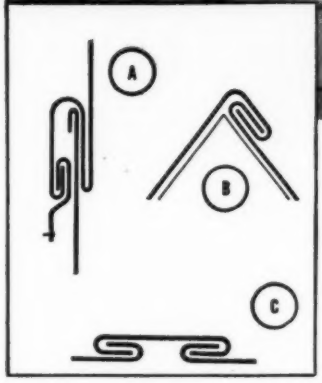
TABLE No. 2

Inches Water	Multiplier	Inches Water	Multiplier	Inches Water	Multiplier	Inches Water	Multiplier	Inches Water	Multiplier
0.020	0.5099	0.075	1.0378	0.130	1.3949	0.185	1.6861	0.60	3.1742
1	.5236	6	1.0452	1	1.4007	6	1.6910	1	3.2026
2	.5370	7	1.0525	2	1.4064	7	1.6959	2	3.2307
3	.5500	8	1.0598	3	1.4121	8	1.7008	3	3.2587
4	.5626	9	1.0671	4	1.4178	9	1.7057	4	3.2863
0.025	0.5749	0.080	1.0744	0.135	1.4235	0.190	1.7106	0.65	3.3138
6	.5870	1	1.0816	6	1.4292	1	1.7154	6	3.3412
7	.5990	2	1.0887	7	1.4349	2	1.7202	7	3.3683
8	.6109	3	1.0958	8	1.4405	3	1.7250	8	3.3953
9	.6226	4	1.1029	9	1.4461	4	1.7298	9	3.4220
0.030	0.6341	0.085	1.1100	0.140	1.4517	0.195	1.7346	0.70	3.4486
1	.6455	6	1.1170	1	1.4573	6	1.7394	1	3.4750
2	.6567	7	1.1240	2	1.4628	7	1.7442	2	3.5012
3	.6676	8	1.1309	3	1.4683	8	1.7490	3	3.5273
4	.6783	9	1.1378	4	1.4738	9	1.7537	4	3.5530
0.035	0.6889	0.090	1.1447	0.145	1.4793	0.200	1.7584	0.75	3.5789
6	.6993	1	1.1516	6	1.4848	10	1.8051	6	3.6045
7	.7097	2	1.1585	7	1.4902	20	1.8509	7	3.6299
8	.7200	3	1.1654	8	1.4956	30	1.8957	8	3.6552
9	.7302	4	1.1723	9	1.5010	40	1.9395	9	3.6803
0.040	0.7402	0.095	1.1791	0.150	1.5064	0.250	1.9826	0.80	3.7053
1	.7500	6	1.1856	1	1.5118	60	2.0248	1	3.7300
2	.7597	7	1.1921	2	1.5172	70	2.0663	2	3.7546
3	.7694	8	1.1985	3	1.5226	80	2.1072	3	3.7792
4	.7790	9	1.2049	4	1.5279	90	2.1472	4	3.8036
0.045	0.7885	0.100	1.2113	0.155	1.5332	0.30	2.1867	0.85	3.8279
6	.7979	1	1.2178	6	1.5385	1	2.2256	6	3.8520
7	.8072	2	1.2242	7	1.5438	2	2.2639	7	3.8761
8	.8164	3	1.2306	8	1.5491	3	2.3017	8	3.9000
9	.8255	4	1.2371	9	1.5544	4	2.3390	9	3.9238
0.050	0.8345	0.105	1.2436	0.160	1.5597	0.35	2.3757	0.90	3.9475
1	.8434	6	1.2499	1	1.5649	6	2.4121	1	3.9710
2	.8523	7	1.2562	2	1.5701	7	2.4478	2	3.9943
3	.8611	8	1.2625	3	1.5753	8	2.4831	3	4.0176
4	.8698	9	1.2688	4	1.5805	9	2.5180	4	4.0408
0.055	0.8784	0.110	1.2751	0.165	1.5857	0.40	2.5526	0.95	4.0638
6	.8870	1	1.2813	6	1.5909	1	2.5865	6	4.0867
7	.8955	2	1.2875	7	1.5960	2	2.6204	7	4.1096
8	.9039	3	1.2937	8	1.6011	3	2.6538	8	4.1324
9	.9122	4	1.2998	9	1.6062	4	2.6867	9	4.1550
0.060	0.9205	0.115	1.3059	0.170	1.6113	0.45	2.7193	1.00	4.1775
1	.9285	6	1.3120	1	1.6164	6	2.7516		
2	.9365	7	1.3181	2	1.6215	7	2.7837		
3	.9445	8	1.3241	3	1.6266	8	2.8154		
4	.9525	9	1.3301	4	1.6316	9	2.8468		
0.065	0.9605	0.120	1.3361	0.175	1.6366	0.50	2.8779		
6	.9684	1	1.3421	6	1.6416	1	2.9087		
7	.9763	2	1.3481	7	1.6466	2	2.9391		
8	.9842	3	1.3540	8	1.6516	3	2.9693		
9	.9921	4	1.3599	9	1.6566	4	2.9993		
0.070	1.0000	0.125	1.3658	0.180	1.6616	0.55	3.0291		
1	1.0076	6	1.3717	1	1.6665	6	3.0586		
2	1.0142	7	1.3775	2	1.6714	7	3.0879		
3	1.0218	8	1.3833	3	1.6763	8	3.1169		
4	1.0293	9	1.3891	4	1.6812	9	3.1457		

Now Gutter Linings Can Give EXTRA YEARS OF SERVICE



Gutter lining is Revere 24 oz. cold rolled copper. Length of sheets 4'0". Transverse seams are 3/4" locked and soldered seams, without cleats. Longitudinal seams and expansion joints are also planned in accordance with Revere's manual.* Photograph and detail courtesy of Nicholson & Galloway, Inc., New York, Sheet Metal Contractors.



● Of all the commonly used sheet metals, copper is the most enduring when exposed to the elements. And now, as a result of Revere's research, important new facts are available which enable you to design or install copper gutter linings, flashings and roofs that give *extra* years of service.

This research has clearly proved that control of three fundamental factors will insure long-service copper installations. They are (1) weight and temper of the copper, (2) design and distribution of expansion joints and (3) strength of transverse joints. Observance of only one or two of these factors may lead to premature stress failures. When all three are controlled maximum length of service is assured.

The findings of this study have been compiled into a 96-page booklet.* It is complete with charts and detailed information so arranged that you can read and apply final figures that insure the finest sheet copper construction.

This book has been widely distributed to architects and sheet metal contractors, and in all probability is in your office files. Be sure to refer to it. If you do not have a copy, write for one now on your office letterhead. If you wish further information, the Revere Technical Advisory Service, Architectural will be glad to help you.

*"*Copper and Common Sense.*"

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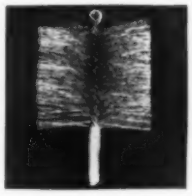
Schaefer BRUSHES

"BUY SCHAEFER----IT'S SAFER"

Performance tested, SCHAEFER Brushes offer longer wear, better service, greater value—with the *correct* brush for every industrial and domestic use.

SCHAEFER Flue and Boiler Brushes of SILVER BRITE Rustproof Wire

SCHAEFER'S special alloy "Silver Brite" rustproof spring steel wire has been developed for longer wear, more effective cleaning. It offers extra value, extra satisfaction in any brush.



SCHAEFER
Rectangular Flue Brushes
No. S-415—2"x4"x4½"
No. S-416—3"x5"x4½"

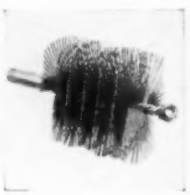
SCHAEFER
Boiler Brushes
No. 3-393—1¾"x4"x5½"
No. S-394—2½"x6"x6½"
No. S-395—3½"x6"x6½"

SCHAEFER
Boiler Brushes
No. S-390—1¾"x4"x4½"
No. S-391—2½"x6"x4½"
No. S-392—3½"x6¾"x4½"

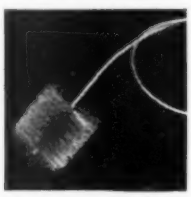
SCHAEFER
Boiler Brushes
No. S-399—2"x4"x6"
No. S-400—2½"x4½"x6"
No. S-401—3"x5"x6"

Single and Double Spiral Flue Brushes
No. S-432—Single Spiral —1" to 4" dia.
No. S-433—Double Spiral —1" to 4" dia.
No. S-434—For small Flues, ½" to 1" dia.

SCHAEFER Round Flue Brushes of Single Spiral, Flat Steel Wire
No. S-430—1" to 4" dia.

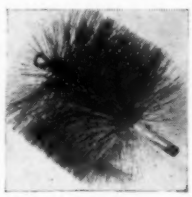


SCHAEFER Rectangular Flue Brushes of Flat Steel Wire—Spiral
No. S-420—2"x3¼"x4"
No. S-425—2¾"x6¾"x7"

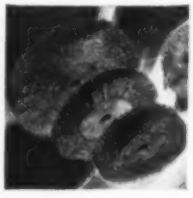


SCHAEFER Furnace Brushes of Silver Brite Rustproof Steel
No. S-442—3", 4", 4½", 5" with 5 ft. handle.

SCHAEFER
Fibre Furnace Brushes
Selected Bassine fibre, flexible wire stem, 4", 5", 6" dia., 48" and 60" handle.
No. S-444-445

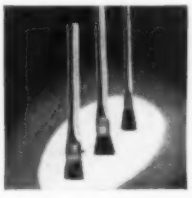


SCHAEFER Chimney Cleaning Brushes
No. 66—6", 7", 8", 10" and 12" dia. round style of Black Tempered Brush Wire.
No. 666—6", 7", 8", 10" and 12" dia. oblong style of Flat Tempered Steel Wire.



SCHAEFER
Wire Wheel Brushes
Solid Center Type of crimped steel wire.
No. 276—6" dia. x 1⅝" face.
No. 278—8" dia. x 1⅝" face.
No. 280—10" dia. x 2" face.

SCHAEFER
Handy Wire Brush
No. 816 — For roughing soldering, etc., 6" long, tempered steel wire trimmed 1½".



Tin Handle Acid or Dope Brushes
Selected grade bristles in tin ferrule. Widths, ⅜", ½", ⅝".

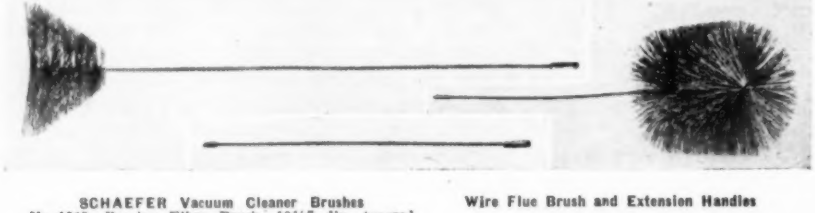
T. W. Flat Acid Brushes
Tinners soldering brush, horsehair filling. 1¼" width. 7½" overall. Twisted wire handle.

Radiator or Condenser Tube Brushes
Twisted in wire handle, selected hair or bristle. Wide range of sizes.
No. 10—⅝" dia. x 2" brush x 6½" overall.
No. 11—½" dia. x 3" brush x 8½" overall.

SCHAEFER Curved Handle Wire Brushes
No. 810—Oil tempered steel wire, trimmed 1¼", hardwood block, 14" long. Brush 6", 2, 3 or 4 rows.

SCHAEFER Shoe Handle Wire Brushes
No. 812—Oil tempered rustproof wire, 5" brush, 2, 3, 4 rows. Trim 1¼", overall 10".

SCHAEFER Straight Back Wire Brushes
No. 800-11—Oil tempered steel wire. Hardwood block, 7⅛" x 2¼". Wire trim, 1⅝", 6 x 19 rows.



SCHAEFER Vacuum Cleaner Brushes
No. 1005—Bassine Fibre Brush, 10½" dia. tapered to 3" dia. x 6 ft. long—48" handle with threaded nipple at end.
No. 1000—Bassine Fibre Brush, 10½" dia. brush x 10" long. Handle 39" with threaded nipple at end.

Wire Flue Brush and Extension Handles
4 ft. Handles with Nipple and Coupling.
5 ft. Handles with Nipple and Coupling.
6 ft. Handles with Nipple and Coupling.

Write for SCHAEFER Catalog of flue and furnace brushes, or for information on any special brushes for specific requirements.

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Left to right—
Director, H. J. Orton, Mrs. Orton; Third V. P., W. H. C. Ness; Mrs. Olmen, First V. P., P. W. Olmen

Left to right—
Mrs. Walsh, President R. E. Walsh; Past President Patrick S. Varden; Mrs. Meyer, National Secretary C. J. Meyer; Mrs. Gundlach; (Treasurer C. M. Gundlach missed).

Annual Convention—S.M.C.N.A.

IN three days of intense activity by more than 300 members in attendance, the Sheet Metal Contractors National Association, during its fourth annual convention in Chicago, April 28, 29 and 30, presented an impressive list of accomplishments during the past year and a future program which covers every problem now confronting the industry.

It was disclosed through committee reports that during the past year numerous activities have now been consummated or advanced to the place where far reaching effects will be felt by the sheet metal, roofing and warm air heating industries in the next few months. Some idea of what has been accomplished and what is proposed may be gained from the following summary of reports submitted:

Secretary's Report

National Secretary Clarence J. Meyer reported that the volume of correspondence from members and interested individuals or groups has increased tremendously in the past year; in addition, the association has been asked to send representatives to meetings, and to serve on committees before government agencies, such organizations as the United States Chamber of Commerce, Senate Investigating Committees, and numerous other bodies endeavoring to do something about particular problems in connection with the construction industry. To all such groups and bodies, said Secretary Meyer, the association believes it has contributed something substantial in advice, information and discussion.

Secretary Meyer reported a membership exceeding 1100 with more than 350 new members obtained during the past ten months. The association has mailed to members and prospective members six news bulletins describing in detail the accomplishments of the association and bringing to contractors all over the country pertinent and timely information. In addition, through the association's bulletins, certain recommendations of the association's committees have been made known to individuals and groups everywhere. The association should and can, said Secretary Meyer, continue to spread such knowledge through wider and wider circles of our industry; the association should aim at a larger membership; more funds should be obtained to enlarge and extend the association's program; and the mutual advantages indicated by committee reports should be disseminated as widely as possible.

Treasurer's Report

Treasurer, C. M. Gundlach reported that the association has enjoyed a substantial increase in its bank balance during the past year, and that funds have been accumulated which will enable the association to inaugurate several programs planned for 1947. In this connection, it might be stated that a change in the basis of dues was voted upon by the convention and by proxies and hereafter the dues for the association will be on the following basis:

Dues to be based upon the number of mechanics employed by the member and shall follow a sliding scale as follows:

Minimum:

1 to 5 mechanics, inclusive	$ 15 per year
6 to 15 mechanics, inclusive	$ 25 per year
16 to 25 mechanics, inclusive	$ 50 per year
26 mechanics and over	$100 per year

Auxiliary dues shall be $25 per year.

Associate member dues shall be $10 per year.

Where a local association wishes to join the Na-

Left to right—
Director C. H. Ruebeck, Mrs. Ruebeck; Director J. J. Walter, Mrs. Walter; Director D. J. Maresh, Mrs. Maresh.

Left to right—
Mrs. Guenther, Director R. H. Guenther; Mrs. Kolbenschlag, Director B. Kolbenschlag; Mrs. Trost, Director L. C. Trost; Director E. Merrick.

tional association as a body (all local members joining) the dues shall be a mininum of $15 per member, plus $3 for each mechanic employed beyond 5 mechanics, but in no instance shall a member pay more than the schedule of dues listed above.

Bookkeeping Committee Report

It was announced that the Bookkeeping Committee, some months ago adopted a bookkeeping system known as the Tarco system which was especially prepared for the construction industry and which will be sold by the association for $30 including sufficient ledger fillers and sheets to operate an average small business for a one-year period. The bookkeeping committee announced that the entire system can be maintained in one ledger and is now available at the association office.

Trade Relations

The Ventilation and Trade Relations Committees, which at the 1946 convention presented a "Declaration of Principles" carried consideration of this declaration forward during the year and from the convention forum offered suggestions that trade relations should cover both preventative and curative measures leading to the correction of certain unsatisfactory practices now in effect.

The committee recommended that because proper ventilation and air conditioning is a technical and intricate subject, all contractors should carefully study the techniques and become acquainted with expected advances in the science. The committee also recommended that manufacturers and distributors of materials and apparatus used in this industry should be asked to sell all such material and apparatus only to regularly established sheet metal contractors, excepting for the sales of parts for replacement to owners. Further, that contractors furnishing the owner with engineering plans should charge a fee for such plans and that such engineering fees should be in line with the fees ordinarily charged by recognized engineers.

OFFICERS

President—Richard E. Walsh, St. Paul, Minn.
1st. Vice President—P. H. Olmen, Chicago, Ill.
2nd Vice President—S. E. Fox, Denver, Colo.
3rd Vice President—W. H. C. Ness, Los Angeles, Cal.
Treasurer—C. M. Gundlach, Sandusky, Ohio.
Secretary—Clarence J. Meyer, Buffalo, N. Y.

Directors, Term Expiring 1948

Louis C. Trost, Erie, Pa.
Charles H. Ruebeck, Waco, Texas.
Joseph J. Walter, Ottawa, Ill.
Rudolph Guenther, Chicago, Ill.

Directors, Term Expiring 1949

Frank Kramer, Milwaukee, Wis.
Benjamin Kolbenschlag, St. Louis, Mo.
A. J. de l'Etoile, Cambridge, Mass.
William Wiedenmann, Kansas City, Mo.

Directors, Term Expiring 1950

V. D. Ramseur, Greenville, S. C.
E. J. Merrick, Louisville, Ky.
Harvey J. Orton, Barberton, Ohio.
Donald J. Maresh, Cedar Rapids, Iowa.

President-elect R. E. Walsh (left) receiving congratulations from Past-President Patrick S. Varden.

The committee further urged that the association endeavor to obtain agreement from architects and engineers to write separate specifications for all ventilation, air conditioning and industrial hygiene control work and should let all contracts for such work separately from mechanical or other contracts. Work awarded to our industry and which should be allocated to us would include:

(1) All sheet metal work with ducts, dampers, casings, etc.;
(2) Fans when used in ventilation, air conditioning or industrial hygiene control systems;
(3) Motors and engines when used in ventilation, air conditioning or industrial hygiene control systems;
(4) Controllers and starting equipment;
(5) Air Washers and their pumps and motors;
(6) Filters and air cleaning devices;
(7) Units and ventilators;
(8) Ozone machines;
(9) Registers, grilles and mushrooms;
(10) Air intakes and discharges;
(11) Insulation for ducts and apparatus and all flexible connections;
(12) Sheet metal work in connection with unit heaters;
(13) Sheet metal work in connection with humidifiers;
(14) Installation of dampers for automatic regulation;
(15) Foundations for all ventilating apparatus and radiator enclosures and recessed linings.

The committee, in conformance with the list of apparatus and work outlined above, urged contractors to submit proposals for complete installations of all such equipment as outlined above to all possible types of purchasers.

Publicity and Membership Committees

H. L. Orton, chairman of the membership and publicity committee, reported that in the past ten months more than 350 new members have joined the national

association and that plans are in preparation to obtain at least five hundred new members in the coming year. Mr. Orton reported it is a big job to cover all parts of the country and to make personal contacts with the various individuals and groups who have expressed an interest in the National association and would like information on the association and its program, but that plans are under way to have officers of the association contact such groups.

Labor Relations Committee

Chairman Louis L. Narowetz, reporting for the Labor Relations Committee reviewed the work of the committee at the 1946 convention when representatives from the employers met with representatives from the Sheet Metal Workers International Association and adopted a labor relations program. Mr. Narowetz recited several sections of the labor relations program, which, he said, are of particular concern to employers at this time. First among these sections was the recommendation of the committee that a standard form of uniform agreement be negotiated between representatives of local unions and employers, the terms of this agreement to be established by the mutual consent of both parties with specific rules and regulations to govern hours, wages, and conditions of employment. Second, that both parties in every proper way try to establish and maintain in our industry a code of fair practices which will insure compliance with the terms of this labor relations agreement. Third, that the industry declare itself to be committed to the principles of private ownership, private initiative and protection of private property, including the right to own and manage property, conceded and safeguarded by the labor relations agreement, and the rights of labor to organize must be respected.

Mr. Narowetz reported that in the past year many members of the association have submitted their labor problems to the Labor Relations Committee and that insofar as has been possible, the Labor Relations Committee has attempted by mail and in person to contact these members and to assist them in straightening out the particular problems submitted. Mr. Narowetz requested that in the future such problems should first be submitted to the Regional Labor Relations Committee member and if this committee member can not advise or solve the problem, the Regional Labor Relations committeeman will then forward the problem to the National Labor Relations Committee for decision and discussion.

Chairman Narowetz announced that the Labor Relations Committee at the present time has 17 members spread across the country so that there is a member of the national committee in practically every important area of the country. The committee plans to increase the number of members of the National committee as needed and each member, in turn, will set up a Regional Labor Relations Committee. The members of these regional committees will be selected from areas within the area of the Regional Committee so that eventually there will be a national or regional labor relations committeeman in practically every important section of the country.

As its program for 1947, the National Labor Relations Committee proposes to explore the following items:

(1) Premium pay for work beyond the 40 hour week on such days as Saturday, Sunday, holidays and shift time.

(2) Single shift pay for night work for clients who cannot stop their business to allow daytime construction.

(3) Elimination of shortening hours in the field, with eight hours' work as per agreement for eight hours' pay.

(4) Increase in production to pre-war level.

(5) Promotion of apprenticeship so as to provide skilled men to replace wartime substitutes who were untrained and in consequence unable to earn the wages paid them and thereby incurring resentment from skilled workers who have the same rate.

(6) Relief for our contractors in competition for sheet metal fabrication and maintenance work by recognizing the need of a Class B mechanic.

(7) Protection for the jurisdiction of our trade and insurance that our contractors with signed agreements shall receive the first consideration of available labor.

(8) Definition of what constitutes a recognized shop and a bona fide shop.

(9) The above items have been suggested to management by its members as controversial, and should be cleared at the council table through collective bargaining. No doubt Labor also has its list of what they may consider violations on our part, and perhaps also may have requests for our consideration. If our joint board meets these issues squarely, perhaps Labor and Management can subscribe to a nationwide agreement to govern conditions of employment, leaving wages to local option. It is becoming more apparent that the cost of living is affected by advancing wages, drop in efficiency of production worker and high profits in some lines of work. Therefore it behooves labor and management to face the issue now, so we as an industry, may contribute something towards full employment and a lower price level.

Apprentice Training

Frank Kramer, Chairman of the Apprentice Training Committee, explained how more than one year ago the National association prepared an apprentice training program which was acceptable to the Federal Apprentice Training Service and how late last year, the Sheet Metal Workers International Association also prepared an apprentice training program. Then in January a subcommittee of the Apprentice committees of both organizations met in Chicago and put the two training programs together—this joint apprentice training program was submitted to both organizations and has been accepted. This acceptable program is now being printed and will be ready for distribution shortly. It has been submitted to all interested agencies of the Federal government and various states and has been accepted by many of these agencies.

Mr. Kramer reported that during the war period there were few apprentices in training; the number of trainees was increased considerably in 1944, so that in 1945 there were 75 registered training programs

in operation; there were 179 programs in operation in 1946 covering more than 3,000 shops and more than 6,000 apprentices. Mr. Kramer suggested that the need for apprentices is so great that in 1947 it is perfectly feasible to place in training at least three times as many apprentices as there are now in training. Forty states in the country, he reported, have shops which are now following the training program of the National association. Mr. Kramer pointed out that while the GI seems to be a very good man, there has been some difficulty with rightly assigning his proper credits and, generally speaking, the industry should, as soon as possible, return to the plan of training civilian apprentices.

Architects and Engineers Committee

Chairman J. E. Merrick, of the Architects and Engineers Committee, reported that while his group had not met during this year, there had been a considerable exchange of correspondence with the result that the committee suggests for consideration two problems: (1) the problem of bid peddling and (2) the problem of obtaining from architects and engineers satisfactory and acceptable sheet metal specifications.

Mr. Merrick said that the evil of bid peddling is not as rampant as it formerly was, perhaps because of shortages of men and materials, but when conditions return to normal, bid peddling will be just as much a headache as formerly. The only way by which bid peddling can be eliminated, he declared, is through continuous and active work on the part of local, state and the National associations, urging and educating contractors to demand all work we are entitled to, and refusing to bid on work for general contractors and architects who insist upon doing bid peddling.

The second problem raises considerable confusion, said Mr. Merrick, because of a lack of proper knowledge on the part of architects and engineers as to just what types of work are covered by our industry's jurisdiction. The problem will be solved only when the National and state and local association constantly educate architects and engineers so they will acknowledge all the work our craft is entitled to.

Forums

On the second day of the convention, contractors attended three forums as follows: Heating and air conditioning; Ventilation and Trade Relations; and Labor Relations.

Most of the work accomplished by the Ventilation and Trade Relations and Labor Relations forums has been described in the reports above.

A summary of the business transacted in the Warm Air Heating forum follows:

The Warm Air Heating Forum, under the chairmanship of K. A. Cronstrom, convened with the first speaker D. K. Smith of the Rochester Gas and Electric Corp., Rochester, N. Y., speaking on "Selection of Gas Heating Equipment."

Mr. Smith spoke of the tremendous increase that had taken place in the demand for gas heating in the last few years and told how the industry had been caught completely off guard by the increase. One bad feature of the expansion in the field was that it saw the entry of some "get-rich-quick" operators who were more concerned with the sales return of the units they made than they were with the durability or serviceability of same.

In this regard Mr. Smith brought out the value of the AGA which offers an "insurance policy" that the equipment will perform as specified. It is not an absolute guarantee of perfection, since failures will still occur, but it is fairly reliable. From this point he went on to offer a few tips on sizing and installation of gas equipment, recommending engineering of the jobs and careful selection of the proper size to handle the job. A discussion of questions from the floor followed.

The Forum was then turned over to Guy A. Voorhees, Application Engineering Director of the National Warm Air Heating and Air Conditioning Association, for a demonstration of the program followed in the Indoor Comfort Conferences now being held thruout the country by the Association. Mr. Voorhees explained the Conferences and the thing that they have to sell—*INDOOR COMFORT*. The sales value of winter air conditioning was stressed and the fact that all air conditioning is based on the circulation of air. In order to emphasize the place of air treatment in *INDOOR COMFORT*, Mr. Voorhees showed the sound-slide film "A Course in Comfort College," which is given in the Conferences. This film gives a graphic description of the effects that are achieved by the "Seven Steps to *INDOOR COMFORT*," pamphlet developed by the Association to sell the consumer on the warm air system of heat.

The speaker then told how the Conferences proceed to a discussion of the No. 7 Code and Manual and how the manual greatly simplifies the task of figuring equipment requirements for a forced warm air installation. He delved back into the history of air circulation and the now-disproved fetish that 5 air changes an hour was an absolute necessity for any forced air job. Investigation has shown that the temperature rise of the returned air is more important than the number of air changes, as far as comfort is concerned. (100 degree temperature rise seeming most desirable.)

The place of the heating survey in the process of engineering an installation is emphasized to the Conferees and students are asked to figure the heat loss on a typical residence to check their ability and understanding of the method presented.

The second of the sound-slide films was then shown to the Forum, this film being titled "It's Comfort They Bought" and dealing with the adjustment and balancing of a forced warm air system. It brings out the theory of continuous blower operation that is being promoted by the Association as the most effective means of combatting stratification and "cold 70." Also displayed were some of the slides that are used to carry home points made about figuring heat losses and furnace requirements. Mr. Voorhees wound up his part of the program by answering, in rapid-fire fashion, any and all questions from the floor.

President's Address

The basic program, plans and principles of the as-

(*Continued on Page 160*)

Warm Air "Short Course"

THE Sixteenth Annual Forced Warm Air Conference, sponsored jointly by Michigan State College and the National Warm Air Heating and Air Conditioning Association, was held at East Lansing, Michigan, March 24th to 27th. In the past fifteen years those attending all but two conferences have been welcomed by either rain or snow. This year was no exception. Before the first day was over the weather man produced a raging blizzard that not only tied up local traffic, but had a big share of the state snowed in for several days.

In spite of adverse weather conditions, three hundred and fourteen students had registered. Thirteen states and Canada were represented with men coming from states as far as Minnesota, Kansas, Arkansas, New York, and Connecticut.

Professor Lorin G. Miller, the perpetual guiding light of the conference, made the opening address. Not only did he welcome the men to the campus of Michigan State but he outlined the program to come and gave some general information to those visiting East Lansing for the first time.

The first lecture was given by Ross Martin of the Research Staff of the University of Illinois. His subject was "Heat Loss Through Building Construction." Slides were used to illustrate various points in his lecture. Figures taken from years of test data at the old research residence located at the University of Illinois were used to prove the value of different types of insulation. It was interesting to note that the actual fuel savings in this residence were within about ten per cent of the theoretical savings. This was substantial proof that insulation and storm sash can effect savings as much as fifty per cent, providing they are properly installed.

E. B. Root of Jackson and Church of Saginaw, Michigan continued with a review of methods of computing infiltration. The importance of a better understanding of infiltration was stressed and simplified methods for estimating air leakage around wood and steel sash were demonstrated. Again the value of weatherstripping and storm sash were emphasized.

Following lunch Bob Waalkes, assistant to the Managing Director of the National Warm Air Association gave a demonstration of the new "Technical Aids" now available from the Association. He also outlined the educational program relative to the local heating schools now being held under the able guidance of Guy Voorhees.

The balance of the afternoon was devoted to the use of the new gravity heating "Short Form 3-47" engineering sheet. A small gravity heating system was figured under the leadership of Clarence Grandstaff of the C. A. Olson Company of Elyria, Ohio. Each student was given one of the engineering sheets and a copy of the plan selected. By the end of the afternoon the job was completed and the students had all information recorded on their engineering sheets.

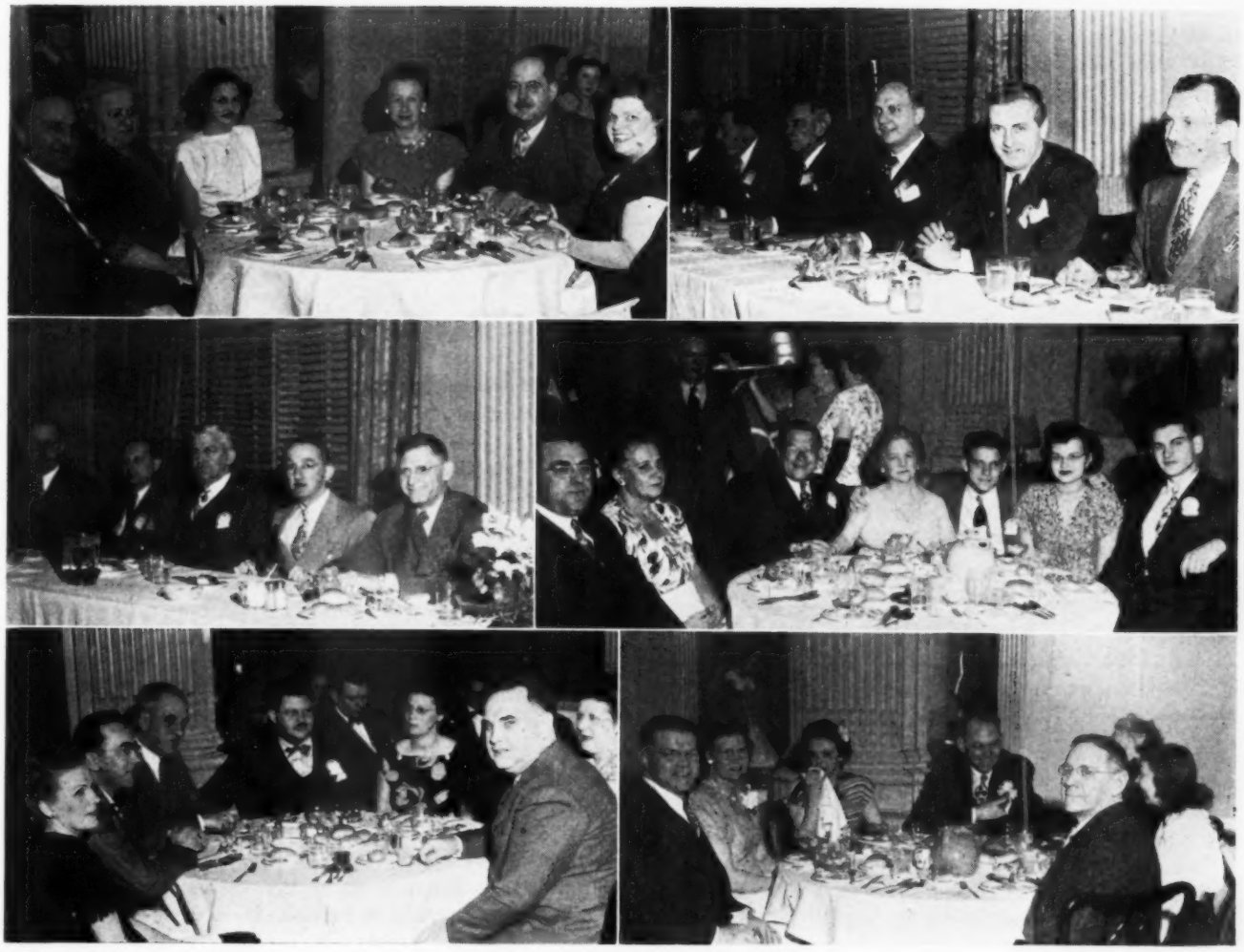
The Monday evening session was a duplicate of the afternoon session with the exception that a new plan and new "Short Form 4-47" was used. Ross Wallis of the Meyer Furnace Co. of Peoria, Illinois was the leader. As in the afternoon session each student received a copy of the plan and the new engineering sheet so he would have the complete information upon his return home. This plan was a small forced air job.

Tuesday morning the student body was divided into small classes of about thirty. With the exception of several lectures woven into the program, the balance of the time was spent in designing a small church school heating system. Each student was provided with a plan and the new engineering sheets 9A-47, 9B-47, and 9C-47. A temporary printing of the new Technical Code was also distributed. Starting with the heat loss, each student figured the entire engineering calculations necessary to design the heating system. This included sizing of the warm and return air ducts and the selection of the registers and grills. The instructors for the classes included E. B. Root, Clarence Grandstaff, and Ross Wallis mentioned previously, and Fred Bishop and Ward Brundage of the Brundage Company of Kalamazoo, Michigan, Francis Hockensmith of the Lennox Furnace Company, Bruce McLouth, now a consulting engineer in Minneapolis, Frank Harbin, of the Home Furnace Company, Kenneth Robinson of the Michigan Department of Health, Dave Levinson of the Research Department of the University of Illinois, and Prof. Charles Pesterfield of Michigan State College.

Several interesting lectures were given during the last three days. They included "Controls" by D. G. Spahr of the Perfex Corporation, "Blower Characteristics" by Ward Brundage, "Furnace Design and Selection" by Paul Barthold of the Kalamazoo Stove Company, and "Chimneys and Combustion" by Prof. Lorin Miller.

The two "highlights" of the program consisted of the Tuesday evening lecture by Prof. S. Konzo of the University of Illinois and the Wednesday evening banquet. Prof. Konzo was in top form and gave a most interesting lecture on panel heating. Much of his time was devoted to a discussion of the nature of "comfort" and some of the factors affecting it. He cleared up many conflicting statements that have been made in the past regarding panel heating. He stated that room air temperatures should be about the same as the conventional heating system, possibly a couple of degrees lower. He also emphasized that economy of operation compares favorably with the well installed heating system. These statements shattered the incorrect ideas that air temperatures of 55° and fuel savings of thirty to forty per cent were possible with panel heating.

The banquet was a joint meeting with the Western Michigan Chapter of the American Society of Heating and Ventilating Engineers. The main speaker was Mr. William Wise, a prominent Lansing lawyer. He gave a most interesting talk on "Your Business and the Law."



The New York Convention

THE New York State Sheet Metal, Roofing and Air Conditioning Contractors' Association held its 24th annual convention in Albany on April 8 and 9. Favored with good weather, the convention attracted attendance from practically every important city in the state as well as individual and small group attendance from scores of smaller communities.

For official business the association heard a very encouraging report on Compensation Group No. 194 by the Managers of the group, Laverack & Haines, Inc.; the managers reporting a substantial money balance in the fund and with some minor exceptions a very encouraging rate of accidents during the past year. This resulted in a substantial dividend return to the members of the group all of whom are members of the New York State Association and engaged in the sheet metal, furnace and roofing business.

Resolutions Adopted

The association took the convention occasion to vote upon some resolutions pertaining to certain important problems of 1947. One resolution recommended a letter from the secretary to members of Congress from New York State, suggesting that arrangements be made whereby veterans may borrow money for the construction of new homes or remodeling of existing structures at a financing rate not greater than 1½ per cent interest. Another resolution to the State Industrial Commission suggested that the cost of compensation as now paid by contractors, is unduly large because of secondary injuries and suggested that cost of such secondary injuries should be born by the state and not by the contractors who employ men having such injuries.

As a result of the current copper situation, the association passed a resolution asking that the import tax on all materials used in construction, particularly the import of copper ore, should be eliminated or reduced so that imported copper may be sold at a rate equivalent to the domestic type, thus stimulating copper production. Also, in line with the copper situation, the association passed a resolution suggesting that the differentials now in effect on copper applying to quantity purchases represent too large a spread and

are unfavorable to the small purchaser and urging the Sheet Metal Contractors National Association to study this particular problem to see whether more favorable differentials for the small buyer can be obtained.

As has been the practice with the New York State association for several years, the architects and engineers of Albany were asked to be guests at a luncheon at which C. E. Knowlton, Jr., president of the New York State Council of Small Business Association, explained the purposes being fostered and some of the problems which the organization is attempting to solve.

The Merchandisers Association, the affiliated organization of salesmen, jobbers and manufacturers, serving New York State contractors, held their annual meeting at the same time as the convention and in accordance with previous practice tendered the contractors a buffet supper and dancing on one night of the convention. To conclude the convention, a banquet with dancing and a floor show was staged on the last night of the convention.

Officers

President—Joseph R. Stiglmeier, Buffalo
1st Vice President—Harry Fitch, Rochester
2nd Vice Pres.—Frank Townsend, Mt. Vernon
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W. Steinhorst, Utica

The National Association

President Patrick S. Varden of the Sheet Metal Contractors National Association reminded contractors that it was the New York State association which several years ago brought to a head the then-planned discussion on the need for a national association and was instrumental in calling the first meeting of state association secretaries and officers for the purpose of discussing the revival of the National association. From this first meeting, followed by other meetings of state association officers, came the beginning of the now active National association. It will be the National association, said President Varden, which will be the means of obtaining uniformity of action and purpose in order to obtain for our craft a basis for sound and profitable operation in the years to come. Our industry, he said, does not now enjoy its rightful place in the overall construction industry; there are problems now arising which will become much more acute in the next few years and only through co-ordinated action through a national association and through strong state associations can these important problems be solved.

As an example of one such problem, President Varden cited the existing figures which show that at the present time approximately sixty per cent of the work done by our craft is in repair and replacement and remodeling, and this work can be very profitable if costs do not get out of line. As an indication of what is taking place, President Varden offered figures showing that in 1940 approximately 48 per cent of an average contract was represented by material and 52 per cent of the contract by labor, whereas in 1946, these percentages have changed to approximately 42 per cent of an average contract for material and 58 per cent for labor. In the electrical industry, by way of contrast, in 1941, 60 per cent of an average contract was represented by material and 40 per cent by labor, whereas in 1944, 58 per cent of this average contract was material and 42 per cent labor, and in 1946, 54 per cent represented material and 46 per cent labor. In the plumbing and heating industry, in 1944, an average contract was divided 60 per cent for material and 40 per cent in labor, and in 1946, the percentages were 67 per cent material and 43 per cent labor. These figures show, said President Varden, that costs in our industry run heavily to labor and since the profit to be obtained from materials and equipment is substantial, our industry is not in as good a position as are some other industries to make the total overall profit which can be obtained by other industries making profit on a larger percentage of material. This leads to the conclusion, he pointed out, that it is a grave mistake for contractors in our industry to eliminate from their contract materials and equipment and take only the work which represents labor. If we neglect to take the materials and equipment, he said, we are definitely reducing our chances of obtaining a good profit from the work we do. It is one of the aims of the National association to urge contractors to take materials and equipment in contract rather than letting materials and equipment go to other crafts. Such problems as these, require strong representation to local state and national association—only as the industry is so organized can the industry hope to obtain satisfactory recognition from the individuals who give out contracts. This particular problem also involves cooperation between employers and the union and in this connection, President Varden said the National association Labor Relations Committee has accomplished an outstanding advancement in the last year in obtaining close cooperation between labor and management in such problems as jurisdictional awards, etc. The National Labor Relations Board, he pointed out, has also been instrumental in suggesting a uniform contract whereby overtime pay shall be uniform throughout the country; through the National Labor Relations Committee, contractor members of the National association have also been urged to negotiate on wages and hours only, eliminating from negotiations all such innovations as holiday pay, vacation pay, welfare funds, etc.

Most contractors in the industry are convinced, said Mr. Varden, that it is necessary for present day employers to protect and to advance the free enterprise system which has been given to us by contractors of

earlier generations. Believing that the free enterprise system is most satisfactory to every one in the country, it is up to present day employers to organize to fight communism, all isms, and other harmful ideologies, which are so current in America today. It is the aim of the National Association, he said to protect and advance the free enterprise system as a whole and the status of our craft in the construction industry and in the nation's economy—with increasing unity between association throughout the industry, such protection and advancement is obtainable.

The Copper Situation

William A. Amelung, manager of sales development, Chase Brass & Copper Company, described the copper situation as it exists today, which briefly may be described as a greater demand than manufacturers can hope to satisfy. Never in the last thirty years, said Mr. Amelung, has the demand for copper been so heavy; copper is being specified and used in many applications never previously considered; part of this demand may be traced to shortage in steel, but part of the demand must also be traced to the recognition that copper is an enduring material and offers advantageous values in many types of application. It seems to be a case of users recognizing the fact that present day costs are very high and they wish to protect these heavy investments through the use of enduring materials.

There is not sufficient copper, today, to keep domestic mills at peak production. To the question of why there was sufficient copper for war uses and not sufficient copper now, the answer lies in the purchase of foreign copper sold at domestic prices during the war—a condition which does not exist at this time because of import tax on foreign copper ores. The result is that America is not buying abroad and the shortage is increasing to the extent where at present there is a shortage of approximately forty thousand tons of copper per month. At the same time the demand has increased 250 per cent with a productive capacity increase of only fifty per cent and much of this increase in shapes which are not used in the construction industry.

The copper industry hopes that in 1948 some sort of a balance may be reached. This anticipates an increase in production of new copper of approximately 70 thousand tons per month—but there is at the same time an anticipated increase in demand in 1948 of approximately double the demand of 1947. The net result is extreme uncertainty as to the copper situation in 1947 and 1948. It is regrettable, said Mr. Amelung, that much of the increased production facilities for war purposes were concentrated on sheet copper 24 inches in width and narrower and much of this narrow width copper can not or has not been used in the construction industry. The speaker also suggested that contractors try to use such narrow-width copper and to also give their suppliers alternate widths which the contractor may use if he can not get just the width he wants.

Installation and Design of Gas-fired Systems

C. L. Benn of the Equitable Gas Company of Pittsburgh presented a very excellent paper on the design and installation of gas heating systems. A full copy of this paper was made available to AMERICAN ARTISAN and in another issue, this paper will be presented in practically complete detail.

Warm Air Heating Education

J. C. Miles, Educational Director, Boston Technical Institute, Cleveland, explained the GI and civilian educational course being offered in warm air heating and air conditioning by his institute. The details of this educational program were published in the March issue of AMERICAN ARTISAN, page 138, and may be very briefly summarized as a 33-week course supervised by Veterans' administration and the U. S. Government, offering instruction in warm air heating and air conditioning, including the design, erection, balancing and adjustment, of all types of warm air furnaces, gas burners, oil burners, stokers and the distribution systems. Also included in the instruction is the design and erection and adjustment of cooling and air conditioning systems, control systems of all kinds, etc. The course of instruction for the GI is paid by the government, the civilian student can obtain information on the cost of the course and the cost of lodgings from the Institute.

Mr. Miles said he could not overlook such an excellent opportunity to remind the contractors that 25 years of experience with forced warm air heating has proven conclusively that one of the inherent characteristics of a forced warm air heating system is its extreme flexibility. In spite of our long experience with forced warm air heating, he said, we are still not delivering to the consumer the ultimate or maximum in service of which a forced warm air heating system is capable. There is still too much "guess" engineering in every day use and this practice of easy estimating can lead the industry into difficulties because year by year the public is expecting increased comfort and

The Merchandisers Association

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2nd Vice President	R. B. Meroney
3rd Vice President	Frank C. Raschka
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R. L. Parrott	Syracuse
M. L. Underdown	Albany
H. J. Breininger	Brooklyn

more satisfactory conditions from the warm air heating system they purchase.

The course being offered by Boston Technical Institute does not propose to produce finished engineers, but does expect to produce young men who have a fundamental knowledge of the mathematics, physics and chemistry involved in warm air heating; a sound knowledge of combustion principles and theory; ability to prepare suitable heating plans; and a working knowledge of the installation and operation of stokers, fans, oil burners, gas burners, controls, etc. Theoretical information is augmented by actual installation, fabrication and forming of all of the duct work which goes into a heating system.

Aluminum Sheet Products

George Perkins, director, Technical Service Department, Reynolds Metals Company, discussed aluminum as an available material for warm air heating, ventilating and air conditioning work at a noon-day luncheon. He described the early discoveries of aluminum and its manufacturing advancement through the years when aluminum sold for as high as $542 per pound down to the present when the selling price is in cents per pound. Production, he said, has increased from approximately 320 million pounds in 1940 at 20 cents per pound to two or two and one-half billion pounds in 1946 (1 million tons) which is still only a small percentage of the total production of more than seventeen million tons of sheet steel, in 1946. On a value basis, with aluminum weighing approximately one-third as much as steel, this represents a capacity of roughly fifteen per cent of the steel sheet production in 1946.

That aluminum will ever be available at prices exactly comparable to steel remains to be seen because the production of every pound of aluminum requires approximately ten kilowatts of electrical energy and while electric energy is cheap in some areas, it is still not cheap enough to make the price exactly comparable.

Mr. Perkins recommended that aluminum in .018, .020, .025 (or very approximately 24 gauge) is probably most satisfactory for residential and commercial ventilating, heating and air conditioning work provided the material be obtained in 2S or 3S one-quarter or one- half hard. These thicknesses and types of aluminum readily work through any of the existing sheet metal machines and are sufficiently stiff to make possible the installation of duct work following the same practices used for galvanized iron. Aluminum has some characteristics not readily obtained in galvanized or black iron—aluminum need not be painted, it has a smaller heat transfer factor; it is much easier on the machines; it is lighter and easier to handle by fabricating and erecting crews; it is seldom necessary to insulate aluminum; and so far as actual records now are available, aluminum has a long life, free from corrosion and with possibly less transmission noise in ventilating systems.

At the present time, the mill price of aluminum in flat sheets is roughly 26 cents per pound as against 23 cents per pound in coils—this being comparable to galvanized iron at 7½ to 8 cents per pound.

Mr. Perkins said some investigations are now under way on new alloys of aluminum which by reason of the basic materials employed may result in a slightly lower priced aluminum coil or sheet than is now available. The speaker also stated that aluminum has some drawback, mainly that aluminum should not be used in temperatures of from 600 to 700 degrees and even at temperatures of 400 degrees F, aluminum will eventually anneal if the 400 degree temperature is consistently maintained.

I. L. O. Ventilation Code

A DISTINCTIVE contribution toward meeting this Government's increased international commitments was made on February 25 and 26 when the U. S. Department of Labor invited the nation's outstanding authorities in the field of industrial ventilation to review a proposed exhaust ventilation code drafted by the International Labor Organization. When ultimately adopted by an I.L.O. Conference which is composed of employer, worker and Government representatives from 57 countries, the code will be transmitted to the Governments of those countries as a guide to the protection of workers against the hazards of industrial dusts, fumes, gases, and vapors.

Purpose of Meetings

Meeting at the invitation of the Labor Department's Division of Labor Standards in Washington, 15 American ventilation engineers and industrial hygiene engineering authorities completed a review of the recommended draft code incorporating accepted techniques, designs, and methods for the engineering control of these work hazards.

David A. Morse, Assistant Secretary of Labor, commended the group for their general cooperation and pointed out that this was the first time the best and most interested minds had assembled to confer on such an important international problem. It is desirable, he stated, to enter international code preparation in an early phase. He stressed the importance to American industry and labor of bringing world labor standards in line with the best practices so that neither may suffer from unfair international competition or sub-standard working conditions.

The proposed code was originally compiled by a member of the I.L.O. Committee on Accident Prevention from various existing American codes with consideration given to British and European viewpoints. Ventilation authorities in other lands are also making their comments and suggestions. All comments will be reviewed by the I.L.O. Committee next August in Montreal and a final draft prepared for the Governing Body, as the I.L.O.'s executive board is called. The Governing Body will schedule the code for consideration at a subsequent I.L.O. Conference as a draft convention or treaty.

Presiding over the meeting of American authorities in Washington was W. N. Witheridge, Ventilation Consultant, Industrial Hygiene Department, General Motors, Detroit, Michigan.

ASSOCIATION ACTIVITIES

Boston

THE old sheet metal contractors association no longer exists, but a number of the sheet metal contractors are now members of the Building Trades Employers Association of the City of Boston, of which John Walsh is secretary.

Washington, D. C.

DURING the winter months the activities of the Sheet Metal Contractors Association of the District of Columbia, Inc., are somewhat curtailed.

The training of apprentices is supervised and governed by the Joint Apprentice Committee. Apprentices are required to attend trade school four nights each week, and are taught by practical men. The school is operated under the Public School System of the District of Columbia.

C. R. Breneman, Secretary

Kalamazoo

AT the March 17 meeting of The Kalamazoo Sheet Metal, Roofing, Heating and Air Conditioning Contractors' Association, all of the officers were re-elected with the exception of the office of vice president. The 1947 officers are as follows:

President—E. J. French
Vice President—Frank Goward
Secretary—R. T. Brundage
Treasurer—John DeHaan

Regular meetings are held the first Monday of each month, with election of officers at the March meeting.

Frank Goward, Vice President

Carolinas

THE April issue of "The Carolinas Roofer" contains an article on "Combustion" by W. R. Hartin, Jr., Columbia, S. C., urging contractors to check draft conditions before signing a contract on a replacement or conversion job, to be sure the chimney is adequate. He urges the use of a flue gas analyzer, a draft gage and a high temperature thermometer to adjust the fuel-and-air ratio of the burner, and not to rely upon setting "by eye."

The subject of waterproofing of masonry walls above grade by C. C. Connor, is continued from the March issue.

J. Roy Martin of Anderson, S. C., suffered $10,000 to $15,000 damage by fire in his office and shop. Galvanized sheets were drenched, but were reconditioned by rubbing the sheets with bran.

Double-shipping of roofing—carloads shipped to the Carolinas and then trucked to Florida, or shipped to New Jersey and hauled to the Carolinas—boosts roofing prices pretty fast, and was commented upon.

J. A. Piper,
Editor "The Carolinas Roofer."

Buffalo

AT the regular monthly dinner meeting at the Markeen Hotel on April 2, the Buffalo Warm Air Heating Association was addressed by John Dowd, filter distribution manager of the Owens-Corning Fiberglas Corporation, who gave a talk on "Fiberglas and its Relations to the Warm Air Industry."

It was explained to the members that new pilot stations were being built in the Pittsburgh area to manufacture gas at the rate of two hundred and fifty million cubic feet per day per plant and four plants of this capacity would be in operation before another year had elapsed.

Sam Wilson, inspector for the Engineering Department, Division of Industrial Hygiene, State of New York, also spoke on industrial ventilation.

Attendance was 76.

L. J. Wieman, Secretary.

Minneapolis

THE following committee appointments have been made by President Parriott in accordance with the provisions of the Constitution of the Sheet Metal and Roofing Contractors Association of Minnesota:

Labor Relations Committee
Chairman: R. E. Walsh, St. Paul
Associates: F. W. Legler, Minneapolis
A. W. Kuettel, Duluth
D. P. Johnson, Willmar
H. Ofenloch, Winona
E. E. Woodhouse, Rochester
L. B. Hill, Austin

Apprentice Committee
Chairman: H. R. Bostrom, St. Paul
Associates: R. J. Kraus, Minneapolis
L. F. Peterson, Duluth

Trade Relations Committee
Chairman: H. W. Quade, Jr., Minneapolis
Associates: R. H. Dose, St. Paul
D. P. Johnson, Willmar
Walker Jamar, Duluth

Education and Ethics Committee
Chairman: A. B. Osgood, Minneapolis
E. E. Woodhouse, Rochester
L. F. Peterson, Duluth

Thomas F. Burniece, Jr., Secretary

ASHVE

Semi-Annual meeting of the American Society of Heating and Ventilating Engineers is scheduled for the 2nd to the 4th of June at the Hotel del Coronado, Coronado, California. Southern California Chapter of the Society will act as host for the occasion with Robert Lowe of Los Angeles serving as chairman of the committee making arrangements for the meeting.

This three day meeting will consist of three Technical Sessions at which nine papers on Research activities and other subjects on heating, ventilating and air conditioning will be presented.

Association Activities . . .

NWAH & ACA

As those who have attended the Indoor Comfort Conferences know, there are two sound slide films shown during the course of the two day school. First of these is entitled "A Course at Comfort College" while the second is a more technical film called "It's Comfort They Bought" that demonstrates the method of securing continuous blower operation in a winter air conditioning system.

The "Comfort College" film neighbors on the realm of fantasy but pictures to even the laymen how the "Seven Steps to Indoor Comfort" affect the life of the person living in the home that is provided with a winter air conditioning system. This latter film can be shown to consumer groups and is an entertaining way for the dealer to increase the demand for the type of equipment that he has to sell. The first film, being of a more technical nature, should only be shown to members of the industry.

The Association has arranged to provide these films, sound records included, to members for the sum of $25 each. They can be ordered direct from the offices of the Association.

The new short forms, 3-47 for gravity installations and 4-47 for winter air conditioning installations, have been made available by the Association. These combine Survey, Work Sheet and Manual Tables in four pages with all the accuracy of the No. 5 and No. 7 manuals and are very handy for figuring heat requirements of homes of 60,000 btu heat loss or 10,000 cubic feet of space. Prices are $2.50 for fifty copies with a 50% membership discount for quantities.

Canadian Chapter, NWAH&ACA

The Canadian Chapter of the National Warm Air Heating and Air Conditioning Association held the sixth of its series of Engineering Schools at Toronto's Old Mill, April 15th thru 18th.

Based on the Association code and manuals the four day courses are divided into two days on heat loss values and gravity warm air heating layouts with the other two days taken up with forced warm air heating theory and practice. Each section is followed by a written questionnaire, with certificates of qualification given at the end of the course.

New York

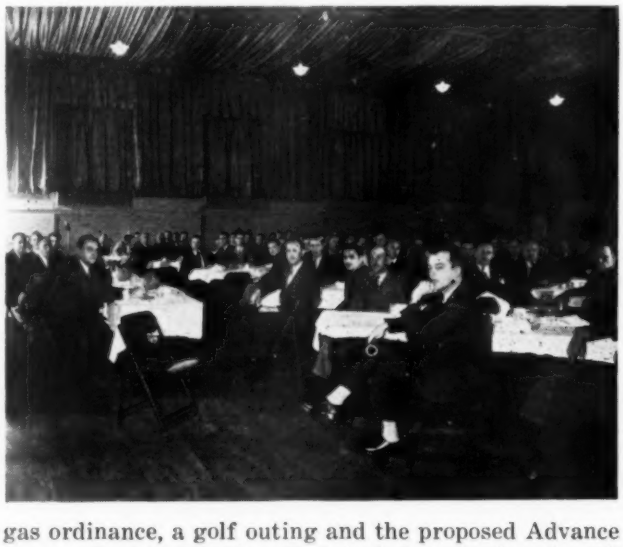
The state association in New York has circularized its members in regard to several bills that are being considered by the legislature of that state. Out of four bills, only one is considered useful to sheet metal contractors.

Of the three unfavorable pieces of legislation the first would make it mandatory for an employer with only one employee to pay unemployment insurance (present limit in state is four); second bill would pay sick benefits of $15.00 to $20.00 per week for twenty-six weeks after one week waiting period. Any one employed for ten weeks (before disability) or eligible for unemployment insurance would be entitled to the payments and they would be financed by a tax of ½ of 1% on the employers payroll; third bill would raise minimum wage in New York from 60c to 75c with an increase to 85c two years after enactment of bill.

The bill which is backed by sub-contractors would require separate bids on all sub-contracts for State work. Thus ventilating and air conditioning apparatus would be bid separately and the general contractor would lose the sub-contractor profit.

Los Angeles

INSTITUTE of Gas Heating Industries of Los Angeles held its March meeting in conjunction with the graduation of the latest class of its Appliance and Service-man's school. The graduates were guests at a dinner and the Institute held the business session to a minimum in order to devote more time to the main program. Standing committees gave reports on the



gas ordinance, a golf outing and the proposed Advance Course in Gas Heating that is being developed with the University of California.

J. Caden Jenkins, general sales manager, Holly Mfg. Co., was the feature speaker of the evening and in addressing the graduates of the school he emphasized the importance of good heating jobs and the need for knowledge of fundamentals before those installations would be possible.

President Gabriel of the Institute closed the program with the distribution of the diplomas.

Coming Conventions and Meetings

May 20-21—Oil-Heat Institute of New England. Annual. Copley Plaza Hotel, Boston, Mass. Fred N. Beckwith, 839 Beacon St., Boston, Mass.

June 5-6—National Warm Air Heating and Air Conditioning Association. Annual. Edgewater Beach Hotel, Chicago, Ill. George Boeddener, Managing Director, 145 Public Square, Cleveland, O.

June 12-13—Carolinas Roofing and Sheet Metal Contractors' Association. Annual. Ocean Forest Hotel, Myrtle Beach, S. C. Joe H. Piper, Secretary, Box 599, Greenville, S. C.

June 16-18—Stoker Manufacturers' Association. Annual. Lookout Mountain Hotel, Lookout Mountain, Tenn.

Association Activities . . .

Indiana State

A REPORT of the 29th annual convention was read before the April 5 board meeting of the Indiana Sheet Metal & Warm Air Heating Contractors Association, Inc., in the presence of all fifteen members—H. W. Meggs, president; O. N. Frank, vice-president; Homer Selch, treasurer; Preston Ake and William Garber, sergeants-at-arms; Lex Balfour, Carl G. Butz, John Novotny, L. D. O'Donnell, A. Schnakenburg and C. O. Stauffer, directors.

Members of the board extended to first vice-president Blount L. Schlemmer their best wishes for an early recovery.

Replies to association letters mailed to all Indiana senators and congressmen, relative to ending priority and directives, were read and the cooperation highly commended.

"Old Faithful" Homer Selch, treasurer, gave a most encouraging report of the financial condition of the State association.

The new monthly bulletins for February and March were approved and ordered continued.

The secretary reported nearly 800 pieces of mail sent out during the past month with copies of the Indiana Fire Marshall's rules and regulations for installation of oil burning equipment. Copies of condensed reports on all new laws by the last general assembly were mailed on April 10.

The purchase of a new typewriter and other equipment for the secretary's office was approved.

The Association subscribed $25 to the Indiana Tax Equality Committee, Inc., to assist in their effort to reduce taxes affecting the sheet metal, warm air heating and other dealers in the states.

A report of the Indoor Comfort Conference showed 102 registrations and that all present at the two-day session were very enthusiastic and voted both the National Warm Air Heating and Air Conditioning Association and G. A. Voorhees their thanks for sponsoring the school.

Blount L. Schlemmer, 214 S. Buffalo St., Warsaw, Indiana, vice president of the Indiana association, has been confined in bed for some weeks with heart trouble. However, his condition is not considered critical, and every good wish goes to Vice-President Blount for his rapid recovery.

The names and addresses of all new contractors in the State is desired by the state secretary, in order to complete mailing lists. The secretary's office is cross indexing and correcting their mailing list, which now includes more than 1300 firms, in order to provide an authentic directory of sheet metal and warm air heating dealers only.

Next board meeting is scheduled for July 12.

Frank E. Anderson, Secretary

New York City

THE success of the Roofing and Sheet Metal Crafts Institute's annual affair last month inspired the arrangements committee—Lawrence C. Corvi, Thomas J. Wynne and Louis Moskowitz—to begin work immediately for next year's event, scheduled for February, 1948, tentatively the 21st. It was suggested that a convention be sponsored to tie in with this annual affair. Final decisions will be made following a report by a special committee headed by President Irving Popik.

The March "Institute Ticker" mentions a movement to unify and modernize building codes throughout the nation. Bernard A. Savage, commissioner of the Board of Standards in New York is one of the organizers of the Building Officials Conference of America. A tentative draft of the basic building code which the conference is sponsoring as the standard for building practices in American cities has been completed.

Members were reminded to get a copy of the Institute's Code of Ethics and read it. The Institute believes it will pay dividends.

The membership roster shows a steady increase. The Institute plans to hold a number of open meetings during the year. Non-members are cordially invited to attend and learn of the Institute's activities. The Board of Directors plan to revive the forum series at which specific subjects dealing with the trade be discussed at length.

Oscar Neilson, 232 Thirty-ninth St., Brooklyn, is reported to be doing well after being seriously ill.

Eugene L. Packer, Corresponding Sec'y.

Minneapolis

MINNEAPOLIS Sheet Metal, Heating and Air Conditioning Association reports the critical shortage of sheet iron as the major problem of the industry in their locality, with sources of supply unable to promise any relief within the next six months. Substitution of aluminum for galvanized iron for the fabrication of duct work has been the only factor to relieve the shortage. However, members have taken on an optimistic outlook that conditions are improving and will continue to do so.

The April 11 meeting, following a dinner by the association for its members, was devoted to the discussion of the labor problem. The demand is for a wage increase from $1.75 to $2.00 per hour.

Following is a list of officers and standing committees for 1947:

Officers—1947

President ..... **A. B. Osgood**
Vice-Pres. ..... **F. W. Legler**
Treasurer ..... **Carl Johnson**
Secretary ..... **Ray Kraus**

Standing Committees

Membership Committee:
K. A. Cronstrom, Chairman
Thos. F. Burniece, Sr.
John Pierson

Program Committee:
Chris Petersen, Chairman
E. L. Knowles
William Gausewitz

Grievance & Standards Committee:
C. O. Carlson, Chairman
Leo Nees
R. A. Gerber

Apprentice Committee:
Ray Kraus
Harry Quade, Jr.
Chris Petersen
C. O. Carlson, Alternate

Telephone Committee:
C. O. Carlson, Chairman
Walter L. Dahleen
R. A. Gerber
John Pierson
Willis J. Kruckeberg
Leo Nees
Ed O'Brien
H. H. Weiland
Clifford Olson
L. C. McKee
H. Neubauer

R. J. Kraus, Secretary

Association Activities . . .

Fox Valley Annual Open House

FOX Valley Furnace and Sheet Metal Contractors Association staged their association's eighth annual get-acquainted night on April 22nd to which were invited contractor members and guests, also jobbers, manufacturers and their salesmen.

This year's open house was held in the sheet metal shop of Joe Strotz in Aurora, with the usual splendid refreshments served by the committee consisting of Phil Ries, Clayton Evelien, Walter Eissler, Don Glossop and William Klinkey.

Under the direction of the Secretary William Stevens and President Fred Lamp, the program was designed to afford each of the visitors an opportunity to say a few words to the approximately 75 persons who attended the meeting.

Immediate Past President Jack Stowell announced the annual convention of the Sheet Metal Contractors' National Association and also reminded the audience that there will be held in Chicago in the early part of June (see American Artisan, April issue, page 100) three and possibly four Indoor Comfort Conferences offered to contractors in the Chicago area by the National Warm Air Heating and Air Conditioning Association. Each of the schools will be two days in length and accommodations will be provided for approximately 100 students at each of the four schools. The schools will be conducted by G. A. Voorhees, Application Engineer, of the Indoor Comfort Conferences.

Most of the addresses delivered were solicitations and expressions of hoped-for continued activity and success by the Fox Valley association. John Sheets of the Messenger & Parks Manufacturing Company (Aurora jobber) and William Taylor of the Western United Gas Company, probably summed up the feeling of the guests when they stated that the splendid spirit of co-operation which exists between members of the Fox Valley Association is responsible in a large measure for the very excellent business relationship which exists throughout the valley between contractors, suppliers, and the public.

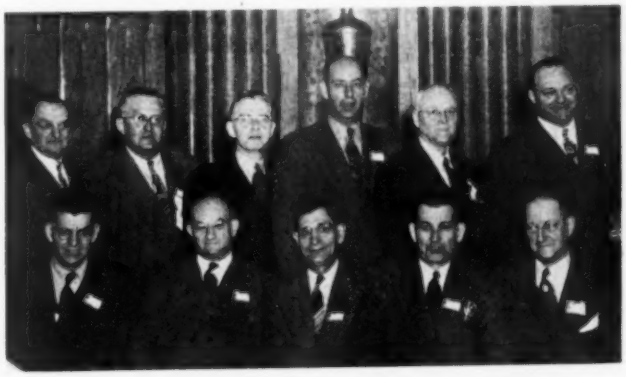
Fred Zabels, president of the Aurora Chamber of Commerce, took the occasion to express his opinion of some of the forthcoming business problems which contractors may be facing very shortly. He said that if a person is willing to listen to all the prognostications, the industry may well believe that we are facing a recession in business, but forecasters to the contrary he, personally, could see nothing but continued activity for the warm air heating and sheet metal contractor because construction is necessary and housing is critically needed and a very large volume of modernization and repair is necessary. Also, said Mr. Zabels, bank deposits have multiplied many times over, and it seems difficult to visualize a depression with everyone having plenty of money. It is true, he said, building costs are too high and building construction may slow down, but a furnace man requires a very small stock compared to such business establishments as dry goods or hardware, and the furnace man can be relatively liquid at all times if he exercises a little business judgment. The building industry, together with automobile manufacturing and farm implement manufacturing, alone could prevent almost any kind of a depression at the moment. But all industries now need, said the speaker, is a revival of good old-fashioned salesmanship so that when things begin to slide everyone can get out and sell.

E. C. Carter of Snips Magazine and Ray Lorenz of Chicago Furnace Supply admonished contractors to watch their accounts receivable in order that money for the job will be collected promptly upon completion—there is some indication, both men said, that prompt payment is slipping gradually and contractors in turn are delaying paying their sources of supply.

Numerous other individuals representing manufacturers and jobbers said a few words and then the evening was turned over to refreshments and general get-acquainted procedure.

Illinois

Association members from other states may be interested in the type of resolutions that occupied the attention of the Illinois convention in Peoria in March. A resolution was passed decrying the recommendation and installation of wooden gutters which were characterized as constituting a disservice to both the owner of the home and the sheet metal trade because of the tendency of such gutters to split and open at mitres and seams.



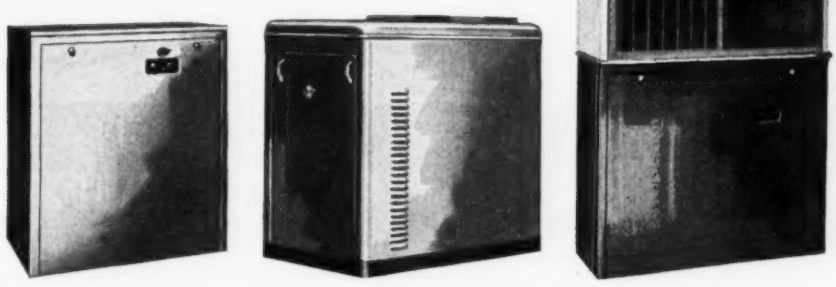
The 1947-48 officers for Illinois are as follows: seated—Vern Tucker, director; W. L. Dennis, president; J. J. Walter, vice president; W. R. Shaw, secretary; F. I. Eynatten, treasurer; standing—directors, R. H. Guenther, Ed Schmidt, E. A. Eichenberger, G. Folkers, E. Lauerman and E. M. Pluth.

Also passed were resolutions: asking an investigation by the University of Illinois on the effect of dirty filters on the efficiency of a winter air conditioning system; requesting the return of the right to erect metal quonset buildings to the sheet metal trade where it belongs; advocating the passage of smoke abatement legislation favorable to the warm air heating industry; requesting a talk on the drying of corn by forced warm air at the next convention; advising the contacting of the manufacturers of metal working machinery in the sheet metal field for more extensive information on the capacities and performance characteristics of their machinery.

Indoor Comfort Conferences

Minneapolis	May 19 & 20
Des Moines	May 22 & 23
Milwaukee	May 26 & 27
Chicago	June 9 & 10
	12 & 13, 16 & 17, 19 & 20(?)

3 (NOT JUST ONE)



1 REFRIGERATION 2 HEATING 3 AIR CONDITIONING

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In the home heating field, Chrysler Airtemp offers a most complete line – boilers and warm air heat for gas, oil or coal. The air conditioning line includes Packaged Air Conditioners, pioneered by Chrysler Airtemp for businesses; cooling and heating combinations for homes, and the new Chrysler Airtemp Room Air Conditioners for homes and offices. Chrysler Airtemp commercial refrigeration comprises compressor-condenser units in capacities for every requirement—reach-in refrigerators and cases, beverage, water, milk coolers and all other applications.

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Dayton 1, Ohio
In Canada—Therm-O-Rite Products, Ltd., Toronto

Automatically Yours

CHRYSLER AIRTEMP
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FOR YEAR-ROUND PROFIT OPPORTUNITIES

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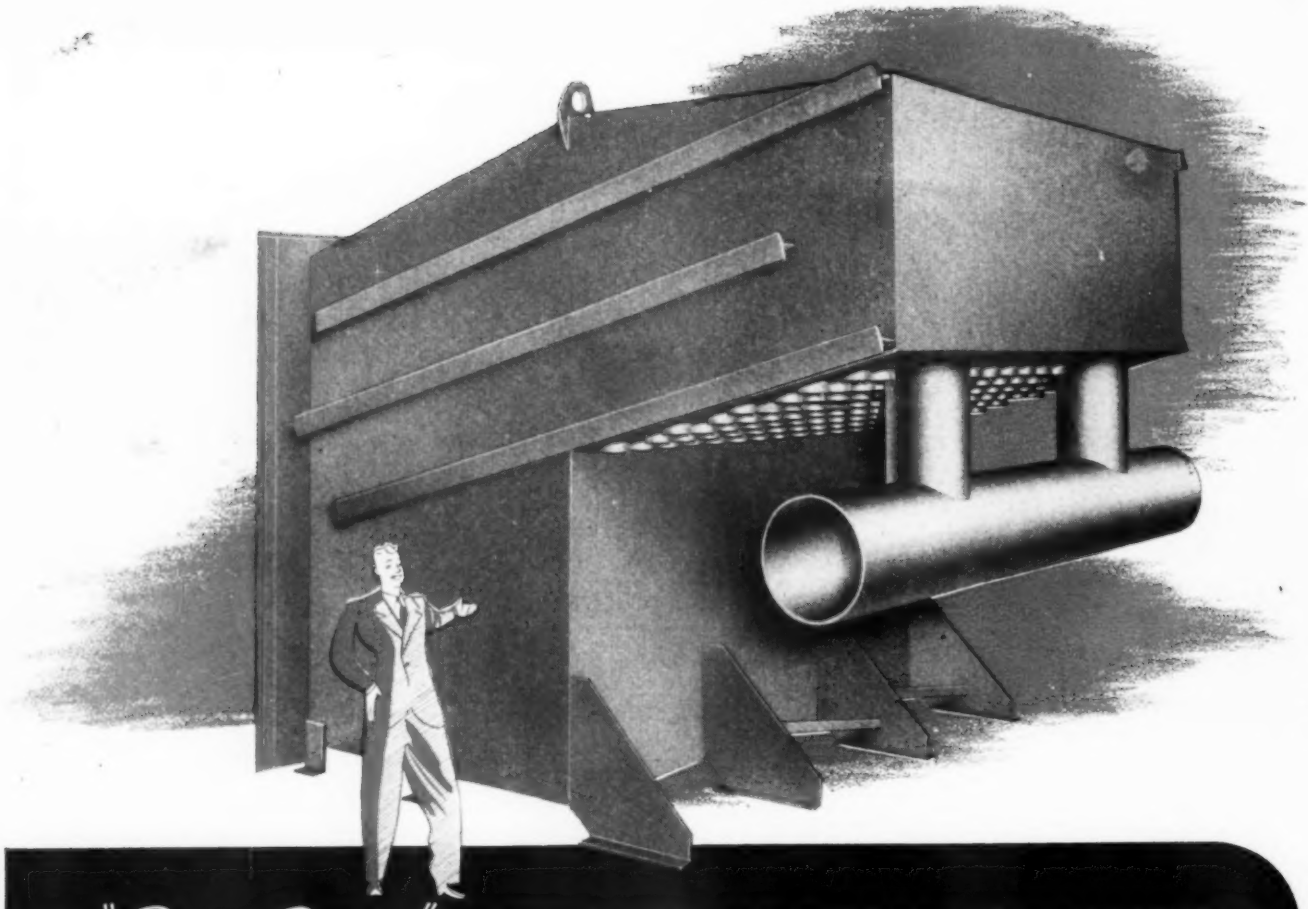
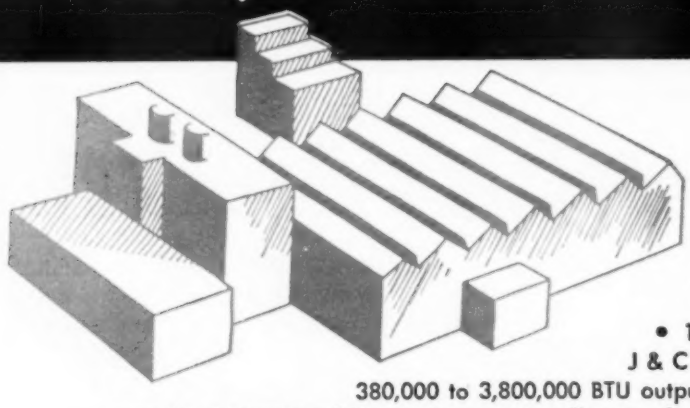


J&C "PoweRated" HEATERS FOR INDUSTRIAL INSTALLATIONS



For bigger profits, sell bigger heating installations. Factories, warehouses, and other industrial establishments. You'll sell them easier with J & C POWERATED Heaters because you can offer these 3-way savings: • 1. Savings in initial installation costs. J & C PoweRated Heaters are available with 380,000 to 3,800,000 BTU output. Hence there is a single, trim, compact J & C PoweRated Heater to meet virtually every heating requirement. No multiple heaters, no complicated auxiliary equipment necessary. • 2. Savings in fuel costs. The J & C increased direct radiation surface produces more heat per unit of fuel — whether coal, gas, or oil. • 3. Savings in maintenance and repair costs. One-piece welded construction insures gas-tight joints—prevents leakage of soot and fumes into air stream—assures a longtime, dependable installation. • You can reach the entire heating field with these 3 big, profitable features, because they apply to every J & C PoweRated Heater . . . and there are models specifically designed for heating stores, apartment dwellings, and practically every other type of building as well as industrial processing. All have specified blower systems, all are readily adaptable to controlled humidification and year-round air-conditioning. Get complete facts from your distributor, or write direct.

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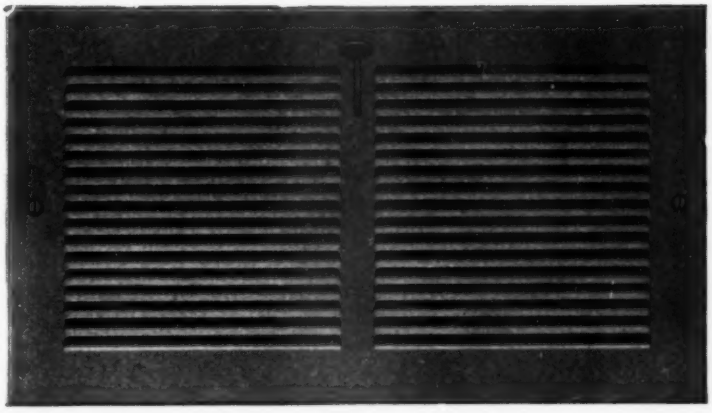


"7000" Series AIRO-FLEX

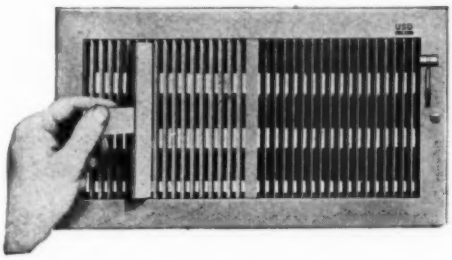
Adjustable for 2-Way Direction

Inexpensive registers need not be cheap-looking, with that "tinny" appearance, or warped and out of alignment when installed, or lacking smoothness in finish or forming. Take this money-saving, extremely popular Auer Airo-Flex "7000" Line for example. It's the logical economical register for your forced air jobs on which 2-way direction flow is adequate. It has single louvre, operated by our patented *spring tension* deflector device, permanently positive. Adjustable fins on face provide up-or-down flow at angle desired. Attractively designed, of good, sound, *neat* construction—the Airo-Flex looks and is a thoroughbred in every detail. Furnished in wall or baseboard models, also for intakes.

Auer offers a complete line of modern and attractive floor, base, and wall registers and return faces, for gravity or air conditioning systems—including all air directional types. We also make flat metal grilles for ventilation, concealment, or other purposes.

Ask for Auer Register Book —or Special Grille Catalog.

Airo-Flex is also made in the "4000" Series with vertical bar grille and multiple louvre. Method of adjustment of grille bars shown below. This gives 4-way control.



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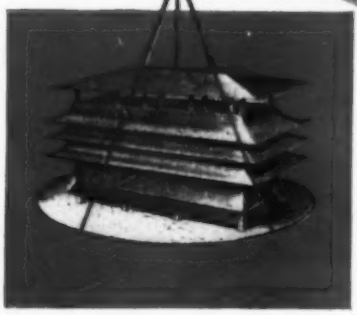
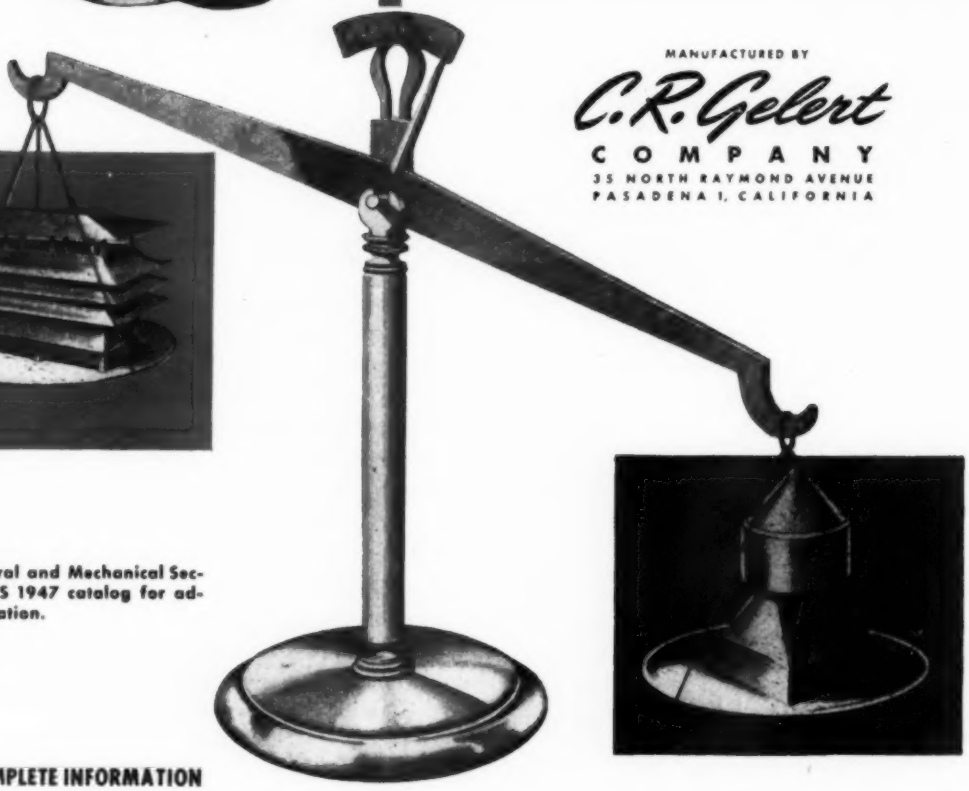
NON-FERROUS MATERIAL—Special alloys are used in the Airjet to resist salt air, corrosion, toxic gas, and fumes.





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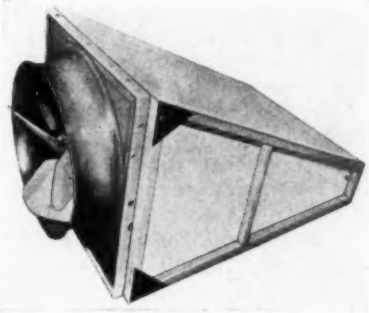
Equipment Developments

For your convenience a number has been assigned to each item. Circle the items in which you are interested on the coupon on Page 132 and mail to us

△ *Indicates manufacturer not listed in 1947 Directory.*
• *Indicates type of product not listed in 1947 Directory.*

• 49—Suction Chamber

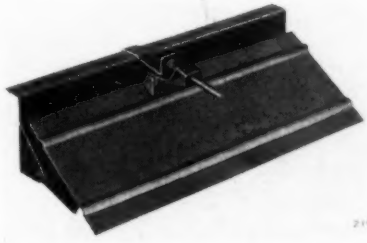
The development of a pre-fabricated suction chamber has rounded out the automatic ventilation "package" that Holcomb & Hoke has been working toward. This suction chamber provides a leakproof enclosure between the fan and the automatic ceiling shut-



ter or grille. It is rigidly constructed with a metal-reinforced wood frame and has self-sealing joints and panels of sound-absorbing material. — *Holcomb & Hoke Manufacturing Co., Inc., Indianapolis, Ind.*

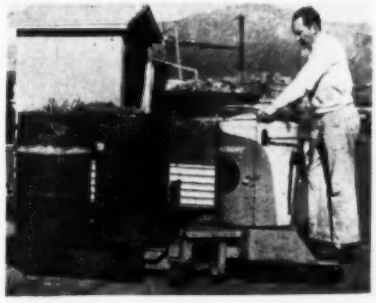
50—Stackhead Damper

Air Control has brought out a stackhead damper that is aimed at making it possible for one man to balance a forced air system.



Available in sizes to fit any standard stackhead the damper is easy to install and in its operation it restricts air to both sides of the stackhead when closed thus assuring even air distribution across the face of the register.—*Air Control Products, Coopersville, Mich.*

• 51—"Turreteer"



With building costs at their present high levels it seems apparent that any release of storage space to production uses is a considerable saving. As a means to this end the Salsbury "Turreteer", a close-coupled material-handling power truck, has been designed.

Employing a direct-drive gasoline motor the Turreteer has an automatic transmission and a minimum of controls, just a throttle, steering turret and brake.—*Salsbury Motors, Inc., Pomona, Calif.*

52—Oil Burner

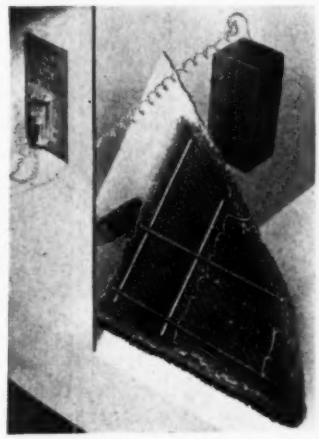
De Soto Oil Burner is producing a line of oil burners that range in size from 1 gallon per hour to 7. These three burners thus cover the field of requirements for domestic installations and some industrial and commercial work.

With a housing of high quality cast aluminum and such features as a grey iron cast tip on the air tube (to prevent warping) the emphasis has been placed on durability and freedom from servicing. Also designed into the burners are freedom from radio interference and ease of installation features.

The fuel pump assembly has a built-in oil strainer, pressure regulating valve and tank hum eliminator and the air control consists of a one-piece unit that can be positioned and locked to insure efficient operation. — *De Soto Oil Burner Corp., York, Pa.*

• 53—"Filter Watchman"

Since there seemed to be no way to arrive at agreement on the matter of how often the filters should be changed in a forced air system Research Products decided to solve the problem scientifically. They have developed an automatic signal-light device known as the "filter watchman."



As can be seen in the illustration the device compares a sample of air drawn through a special tube with the flow of the air going through the air filters. When the filters are restricting the flow of air too much the signal lights. The system can use 20-volt current from the low voltage circuit of the control system or from a doorbell transformer. —*Research Products Corporation, Madison, Wis.*

54—Ventilator

The Ject-o-valve, a powered ventilator that uses a propeller fan to exhaust heat, smoke and fumes through a divided top has been developed by Swartwout. This top opens and closes automatically and is weather tight at all times.

Five sizes are being produced with a wide range of capacities.—*Swartwout Company, Cleveland, O.*

Equipment Development . . . . . .

For your convenience in obtaining information regarding these items, use the coupon on Page 132

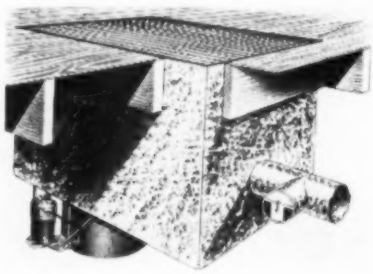
55—"Coal-Flow"

The Iron Fireman decided that it might be necessary to go around corners in some houses where the installation of the coal-bin had been impractical so the coal shoveling iron man has developed a Coal-Flow stoker that has a universal joint in the coal carrying tube that lets it get around many previously impassable obstructions.

As an aid to servicing, the conveying mechanism has been made easily available for inspection.—*Iron Fireman Manufacturing Co., 3121 W. 106th St., Cleveland 11, Ohio.*

56—Floor Furnace

The Gillen Company has introduced an automatic oil-burning floor furnace designed for small home installations. Features of the furnace are a connection arrangement between the combustion chamber and the heat exchanger that permits servicing at the floor level and a new and improved burner which operates cleanly on low natural draft.



Compact in design the furnace is only 41¾" in overall height, is 36 3/16" long, 24 3/16" wide and weighs approximately 190 pounds. It operates on No. 1 fuel oil or kerosene and has an output of 50,000 Btu.'s per hour.—*J. L. Gillen Co., Dowagiac, Mich.*

57—Gas Furnace

A gas-fired winter air conditioner built around the Norman single-port, self-piloting, flame retention type of burner has now been developed. The unit is compact and sturdy and is arranged so that all parts are easily accessible for servicing. The burner and pilot can be quickly removed through the access door without disconnecting controls or burner manifold. Filters can be removed by means of a service panel without the use of tools.

The unit will handle natural, mixed, manufactured or LP gas and is available in three sizes—60,000, 90,000 and 125,000 Btu input.—*Norman Products Co., Columbus 8, Ohio.*

58—Vacuum and Blower Combined

Breuer has re-designed its industrial vacuum cleaner in such a fashion that the motor-fan unit can be easily removed from the top of the machine and it then becomes a powerful portable blower that is a good size for hand use. It produces a blast of clean, dry air at a rate of 295 miles per hour that removes dust and dirt from many hard-to-reach places around a plant.

When the unit is then returned to the top of the vacuum cleaner and locked in place it is again available for suction cleaning. This cleaner uses a 1 hp motor to secure a cleaning power of 185 cubic feet of air per minute with a 49 inch waterlift and it weighs only forty pounds.—*Breuer Electric Mfg. Co., 5100 N. Ravenswood Ave., Chicago 40, Ill.*

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Equipment Developments . . . . . .

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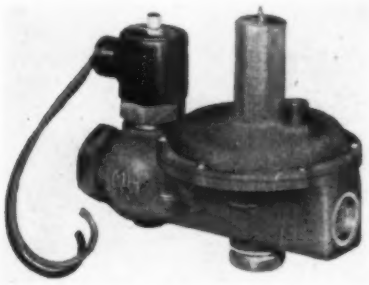
59—Gas Control

A new control, which combines a solenoid gas valve and a diaphragm regulator, has been developed by Minneapolis-Honeywell in order to eliminate the need for manufacturers purchasing separate valves and regulators.



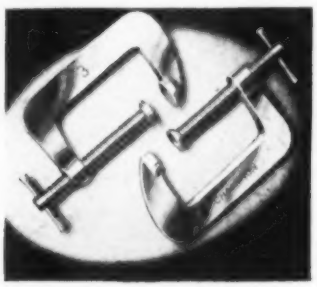
It will contain a magnetic gas valve with a weight and spring-loaded combination regulator and will go into production late in 1947 after the present demand for standard controls has eased a bit.

Designed of lightweight materials it is adaptable to the use of butane and propane as well as natural gas.—*Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave., S., Minneapolis 8, Minn.*

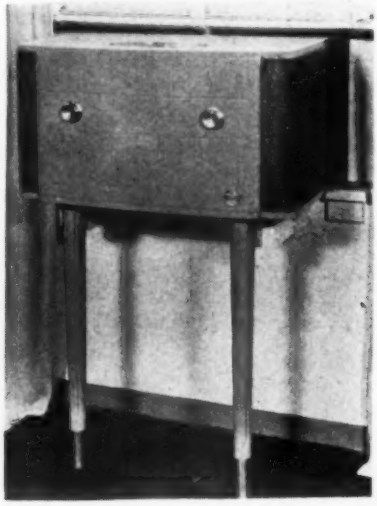
60—"C" Clamp

An aluminum "C" clamp has been marketed that may relieve the shortage of malleable clamps to some extent. The new clamp has aluminum's strength and lightness and is of a wedge design for greater durability.

Openings range from 2½" to 6" and depths are between 1¾" and 2¾". Prices are comparable to the malleable product. — *Western Tool & Mfg. Co., Inc., Springfield, Ohio.*



61—Air Conditioner



Chrysler Airtemp has designed a new room air conditioner around their Sealed Radial Compressor, a unit that does away with drive belts and shaft seals and permanently seals out dust, dirt and moisture.

Operation of the unit has been simplified to a point at which it uses a single control knob marked "Fan" for ventilation and "Cooling" for use of the fan and cooling mechanism as well. Another knob regulates the amount of outside air that the unit will bring in and this outside air is brought directly through the filter and cooling coil.

The conditioner weighs only 196 pounds and is provided with two front legs to support it on the inside of the room. — *Airtemp Division, Chrysler Corporation, Dayton, O.*

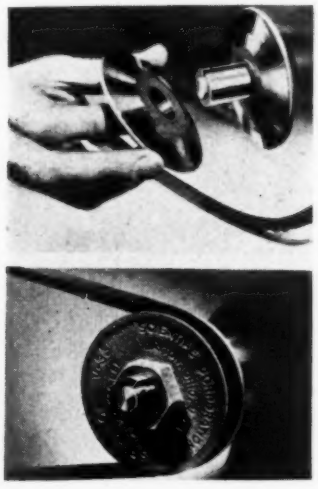
62—Thermostat

A "snap-action" room thermostat that features a Spencer Thermostatic Disc has been developed by Klixon. With all complicated actuating mechanisms eliminated by the use of the disc the new thermostat is accurate and positive in operation.

It is applicable to warm air systems, air conditioning systems and other like uses.—*Spencer Thermostat Co., Attleboro, Mass.*

63—Belt Pulley

A variable pitch V-belt pulley has been developed that locks onto its shaft by means of a spiral wedging action which eliminates the use of set screws, threads or keyways. The pulley is in rigid alignment when locked and numerous adjustments may be easily made. It will drive in either direction.

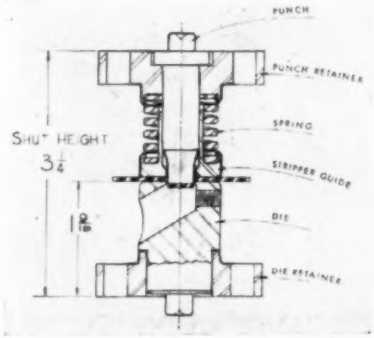


The pulley is especially adapted for use on air conditioning equipment, machine tools and all V-belt connected apparatus. — *Scientiae Corporation, 103 Pine St., Dayton 3, Ohio.*

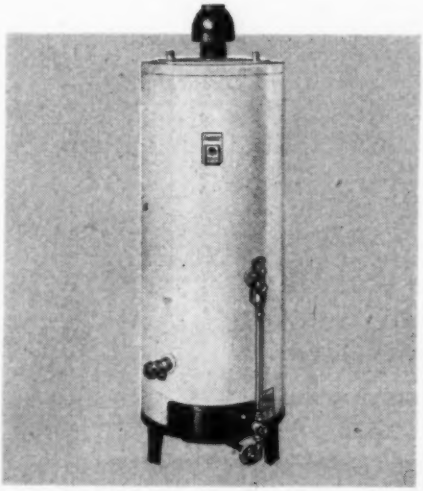
64—Punch and Die

A line of low shut height (3¼") interchangeable self-stripping punch and die sets which will operate in the smallest press equipment are now available.

Of simplified construction (only 6 parts) with air slug ejection and a wide range of hole sizes (1/32" to 1-1/32") these units can be mounted with the use of just two screws.—*Raar Mfg. Co., 1663 N. Highland, Los Angeles 28, Calif.*

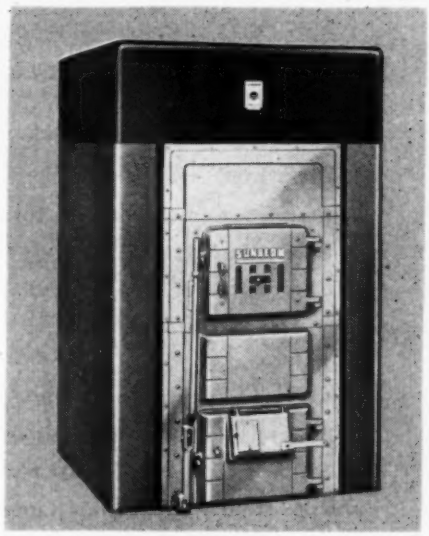


››› More American homes have heating and plumbing products by... AMERICAN-Standard than by any other single company

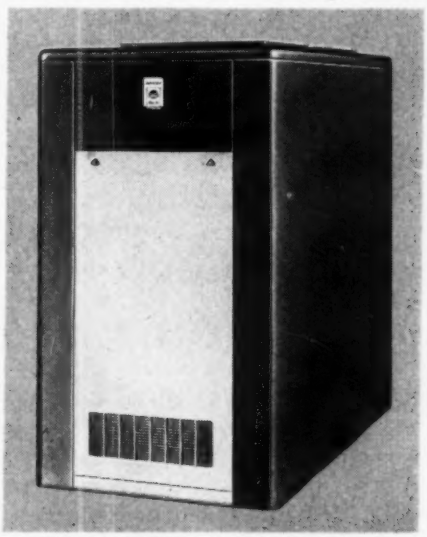


The **BUDGET** Gas Fired Automatic Storage Water Heater. Has single center flue that provides large heating surface, spiral steel flue baffle that assures maximum heat transfer from hot gases. Jointed construction of spiral baffle makes it easy to remove, clean and inspect. Burns natural, manufactured, mixed or liquefied petroleum gas with efficiency and economy.

■ Yes! American-Standard Heating Equipment has long enjoyed a public acceptance that's second to none! And this public acceptance and demand for our famous Sunbeam line of winter air conditioners and warm air furnaces is greater today than ever before. Remember this when you're planning for a bigger share of new business. For with American-Standard you have a long established name . . . a familiar, easy-to-remember trade-mark . . . and nationally advertised products that lead the field in smart styling, expert engineering and sturdy construction. In addition, you can sell for modernization on the convenient Time Payment Plan of the Heating & Plumbing Finance Corporation. For details, contact your Wholesale Distributor. **American Radiator & Standard Sanitary Corporation,** P. O. Box 1226, Pittsburgh 30, Pa.



The **ARLINGTON "SQUARE"** Warm Air Furnace. Heating element and extra large radiators are of heavy boiler plate steel for long life. Full height fire box provides long firing period. Duplex grates for convenience in maintaining a clean fire. Made in 20", 22", 24", and 27" shell diameters and in models for coal (hand-fired or stoker) or oil.



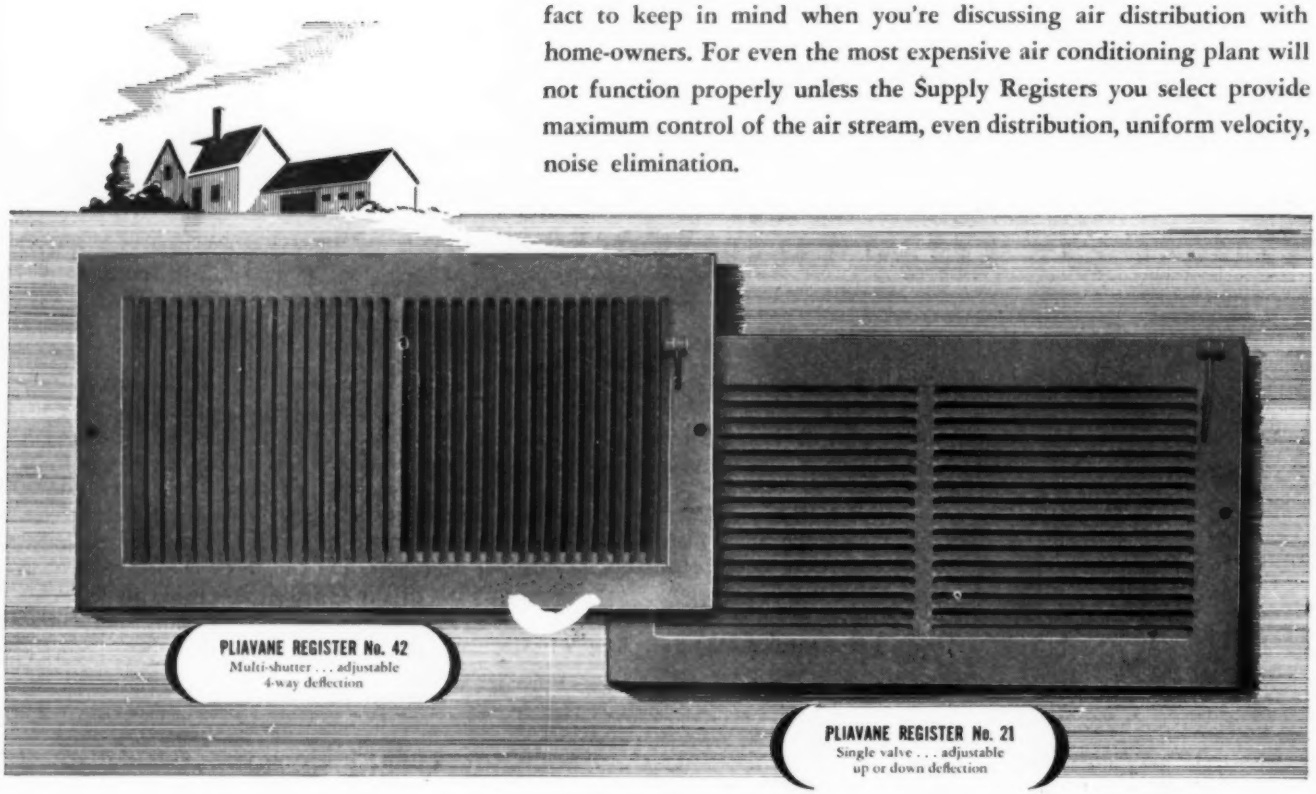
The **SARATOGA** Winter Air Conditioner. A modern, low-priced oil fired unit for small homes. Features heating element of heavy boiler plate steel for long service. with seams riveted and welded for leak-proof construction. Pre-heating return air assures top efficiency and fuel economy. Compact jacket encloses blower-filter unit and heating element . . . also provides space for concealed Arcoflame or any other standard burner.

AMERICAN-Standard HEATING · PLUMBING

Serving the Nations' Health and Comfort

LOOK FOR THIS MARK OF MERIT—It identifies the world's largest line of Heating and Plumbing Products for every use . . . including Boilers, Warm Air Furnaces, Winter Air Conditioners, Water Heaters, for all fuels—Radiators, Convectors, Enclosures—Gas and Oil Burners—Heating Accessories—Bathtubs, Water Closets, Lavatories, Kitchen Sinks, Laundry Trays, Brass Trim—and specialized products for Hospitals, Hotels, Schools, Ships, and Railroads.

EFFECTIVE CONTROL OF AIR DELIVERY MEANS MORE EFFICIENT OPERATION OF RESIDENTIAL AIR CONDITIONING SYSTEMS. An important fact to keep in mind when you're discussing air distribution with home-owners. For even the most expensive air conditioning plant will not function properly unless the Supply Registers you select provide maximum control of the air stream, even distribution, uniform velocity, noise elimination.

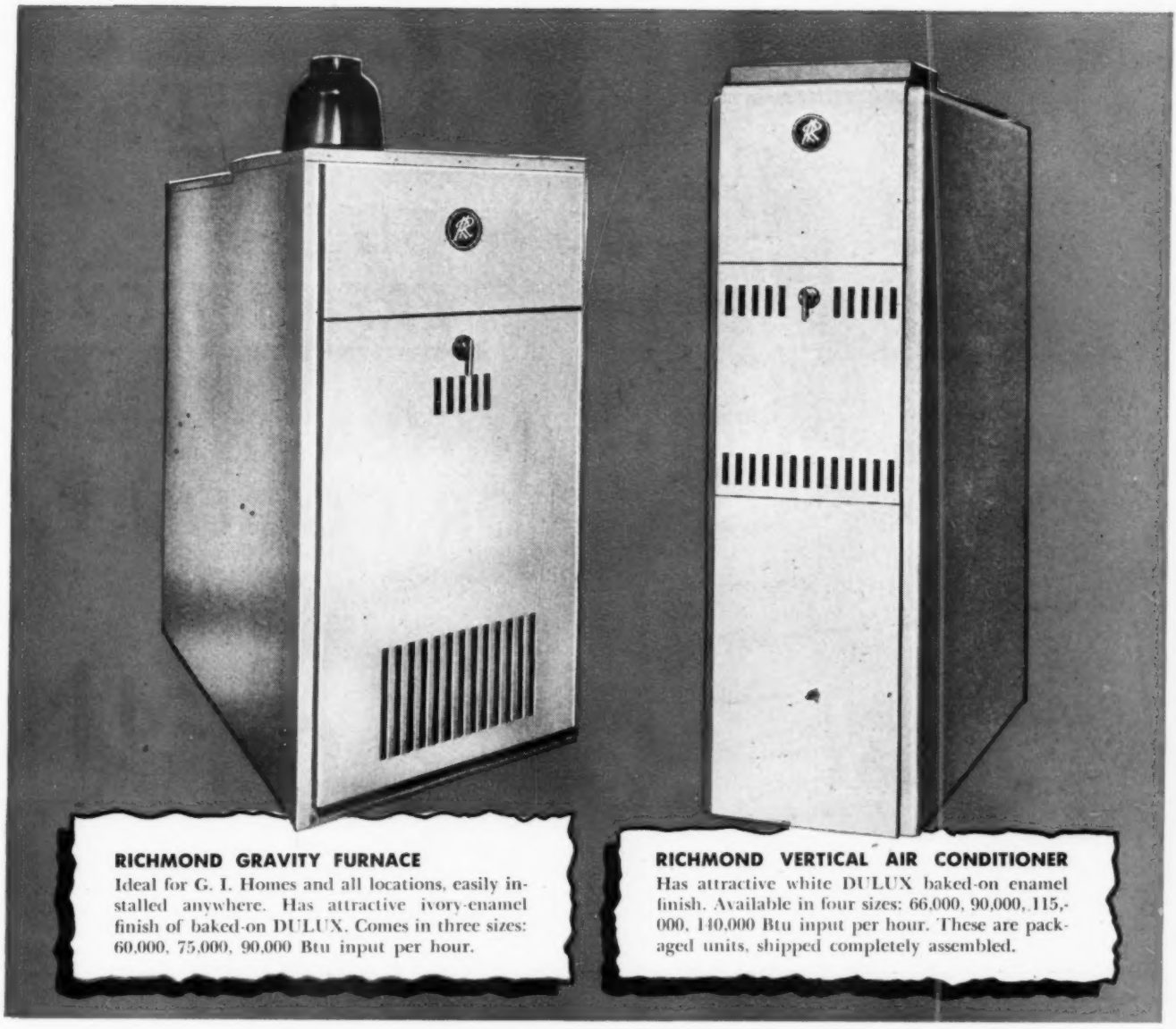

PLIAVANE REGISTER No. 42
Multi-shutter . . . adjustable
4-way deflection
PLIAVANE REGISTER No. 21
Single valve . . . adjustable
up or down deflection

When your customers look to you for advice on the selection of equipment to meet these performance requirements, be sure of dependable results, user satisfaction. Recommend trim, attractively-designed Tuttle & Bailey PLIAVANE Registers for installation *at the vital point of air distribution.*

Two types available . . . single valve PLIAVANE Registers (No. 21) for upward or downward air deflection control . . . multi-shutter type (No. 42) that provides four-way deflection . . . face bars and back blades readily adjustable. Range of sizes in both types for sidewall or baseboard installation. May be used without frames . . . or with standard frames.

TUTTLE & BAILEY

NEW BRITAIN, CONNECTICUT



RICHMOND GRAVITY FURNACE
Ideal for G. I. Homes and all locations, easily installed anywhere. Has attractive ivory-enamel finish of baked-on DULUX. Comes in three sizes: 60,000, 75,000, 90,000 Btu input per hour.

RICHMOND VERTICAL AIR CONDITIONER
Has attractive white DULUX baked-on enamel finish. Available in four sizes: 66,000, 90,000, 115,000, 140,000 Btu input per hour. These are packaged units, shipped completely assembled.

2 GOOD PROFIT-MAKERS
. . . and more to come!

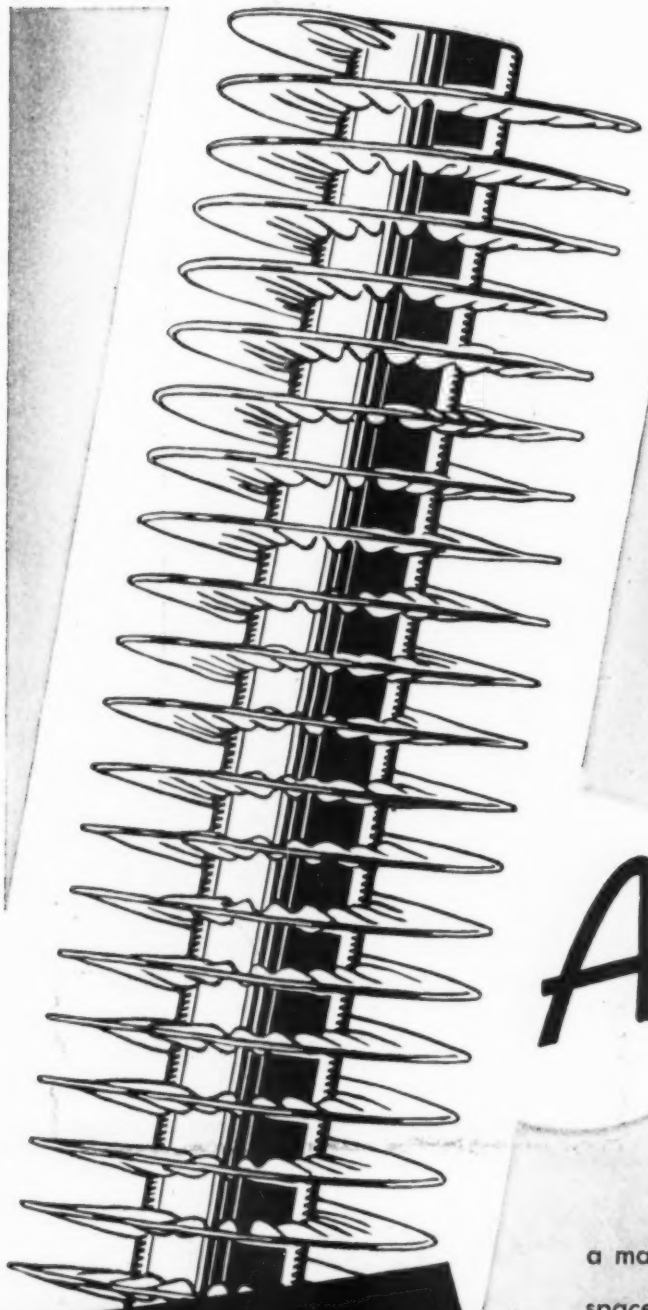
These two gas furnaces pack eye-appeal, buy-appeal and a *full* profit for you. And—they're only the vanguard of the complete Richmond line.

The packaged air-conditioners are the simplest things to install you could ask for. Their white Dulux enameled jackets look clean, stay clean.

These forced air units range from 66,000 Btu input up . . . the gravity units from 60,000 Btu input up. Made by Richmond Radiator Company, 80 years in the heating business, 19 years building gas heating equipment. Backed by *both* AGA approval and a one-year replacement guarantee, these furnaces inspire customer confidence.

The units illustrated are available to qualified contractors through your regular wholesaler. Call him now or write Richmond Radiator Company, Dept. AA-5, 19 East 47th Street, New York 17, N. Y., for name of nearest Richmond distributor.

RR RICHMOND RADIATOR COMPANY
Affiliate Reynolds Metals Co.
Enameled Cast Iron Ware • Vitreous China • Porcelain-Steel • Gas Boilers • Gas Winter Air Conditioners • Gas Gravity Furnaces • Radiators



HIGH SPEED
HIGH EFFICIENCY
IN HEATING OR COOLING...

AEROFIN

Aerofin is sold only by manufacturers of nationally advertised fan system apparatus. List on request.

For exceptionally fast heat transfer at a material saving in fuel, power and valuable space, install Aerofin fin-type coils. Famous for the accuracy of its published ratings, Aerofin can be installed to its full rated capacity. Metal-to-metal bonding and complete tinning maintain full capacity throughout the life of the installation.

Complete range of types and sizes. Expert engineering service available on request.

AEROFIN CORPORATION

410 South Geddes St., Syracuse 4, N. Y.

NEW YORK • CHICAGO • CLEVELAND • DETROIT • PHILADELPHIA • DALLAS • MONTREAL

DEALER PROFIT

EVANS

CUSTOMER SATISFACTION

EVANS LINKS THEM UP *for you*

WITH THIS *70,000 B.T.U. GRAVITY FURNACE* FOR SMALL AND MEDIUM HOMES

Here's the best automatic oil-burning gravity furnace you've ever seen. EVANS has spared nothing to design and engineer this furnace to fit squarely into your biggest market. We're in good production right now. This furnace can be set up quickly—adapts to basement or utility room needs—has a handsome Corsican Red baked enamel finish, features an efficient pot-type burner with hi-lo flame. Thermostat control and automatic draft regulator. Efficiency and economy proved. *Write for complete details.*

AND...THIS AUTOMATIC OIL-BURNING WATER HEATER IN 3 SIZES FOR DOMESTIC AND COMMERCIAL INSTALLATIONS

Hot water is a universal household need and everyone *prefers* to have it *plentiful* and *automatic.* EVANS meets those needs with these high capacity, high quality, low cost operation oil-burning Water Heaters. No gas or electrical connection needed. An EVANS can be installed anywhere—in town or country. Fine looking, quiet, clean, automatic. Here's profitable business for you. Three sizes: 20, 30 and 45-gallon capacities. *Write today for details.*

Heating and Appliance Division

EVANS PRODUCTS COMPANY

PLYMOUTH, MICHIGAN

The world over...wherever there's GAS!

Dependability

THERMAC HM Appliance REGULATORS

The most important single element you buy in an appliance regulator is DEPENDABILITY. The ability of a regulator to perform without fail day in and day out under all operating conditions goes back to its design and production methods employed.

We concentrate on building one product—"HM" Thermac low pressure Appliance Regulators for Natural and Manufactured Gas and Butane-Air. This work receives our full undivided attention. Every element of design—every piece of material used has been studied, tested and proven by long usage. Extra strength is provided at critical points. This extreme care makes for DEPENDABLE Regulators and DEPENDABLE Appliances.

CHECK THESE 10 MAIN FEATURES

▶ High Capacity—Close Control ▶ Low Maintenance ▶ All Aluminum, Light Weight, Rugged ▶ Max. Inlet Pressure 15" WC; Max. Outlet Pressure 5" WC ▶ Parts Corrosion Resistant ▶ Inspect without removal from line ▶ Factory Tested and Sealed to Your Specifications ▶ Certified by A.G.A. ▶ Millions in use ▶ Sizes: from ⅜" to 2½ IPS.

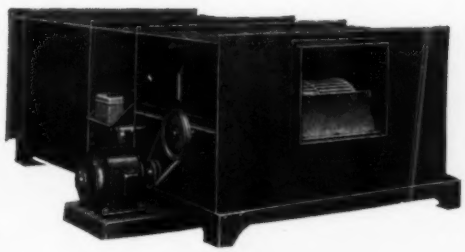
THERMAC

COMPANY

800 East 108th Street

Los Angeles 2, Calif.

AIR WASHERS
AND PURIFIERS



MULTITHERM
CONDITIONING UNITS

VENTILATING AND
CONDITIONING FANS

Clarage

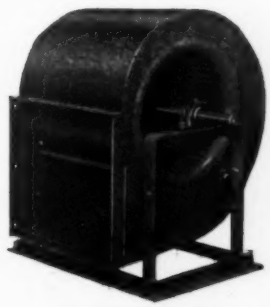
—HEADQUARTERS FOR AIR HANDLING AND CONDITIONING EQUIPMENT

FOR nearly 40 years — *through constant product improvement* — Clarage has maintained leadership in this specialized field . . . Directing your air handling and conditioning requirements our way is to place them in capable hands . . .

CLARAGE FAN COMPANY
Kalamazoo, Michigan
Application Engineering Offices in all Principal Cities

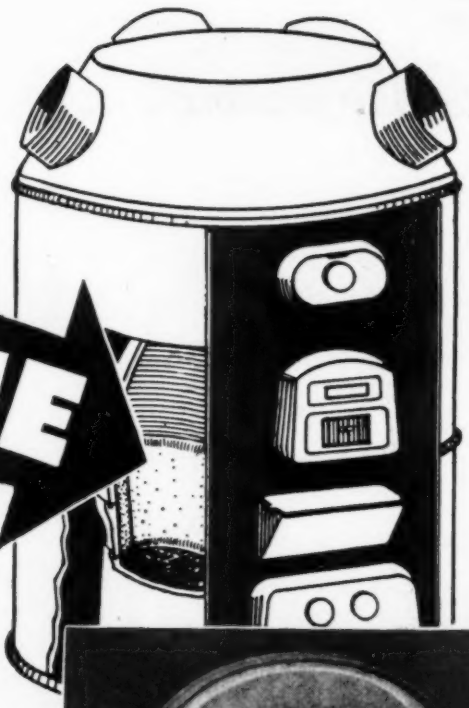
INDUSTRIAL
PROCESS FANS

UNICOIL
CONDITIONING UNITS



FURNACE AND
UNIT CONDITIONER FANS

Next time a firepot job comes up



use FIRELINE

It saves dollars for your customer and makes dollars for you . . . .

Fireline isn't the *only* way to repair a furnace with a cracked firepot; it's simply the *best*. When you use it, and see the results it gives, you'll know how true this is. You'll find that Fireline does a job which pleases the customer and saves him money. And you'll also find that it makes more dollars for you. You just can't beat the kind of proposition that benefits both you *and* your customer!

Renews burned-out firepots

Don't ever think of Fireline as a patching material. It is a means of completely renewing the firepot—a high-quality refractory moulding material in moist, plastic form which forms a *complete lining* entirely around the firepot castings. The fire bakes it into a durable, one-piece lining that withstands temperatures up to 3,000 deg. F.—a far higher temperature than ever occurs in a domestic furnace.

This *complete* lining closes all cracks and holes sealing the firepot gas tight and stopping all escape of gas, odors, and soot into the ducts. No new casting could be more gas tight. When the job is done, you have in reality a complete firepot of strong refractory meterial within the old castings. And you'll find that it produces a better, cleaner fire, too, because the Fireline lining reflects and radiates heat across the entire fuel bed.

Easy to install

These are the things that please your customer. To you the big advantage of Fireline is its ease of installation. There is no dismantling—no waiting for castings. You simply install the Fireline lining through the furnace door. Just pound it in place with a hammer and trim it smooth. It's ready for use—nothing to mix—nothing to add. The speed and ease of installation cuts your cost so that you can give your customer a lower price and still have a larger margin of profit.

Many furnace men are using Fireline to line firepots still in good condition —to protect the castings and improve combustion. It can be moulded to any shape to replace or repair refractory tile in steel furnaces, too. In Fireline you have no material for all purposes—absolutely indispensable for those rush and emergency jobs!

Your jobber has it . . .

Fireline is stocked by leading jobbers everywhere. Ask your jobber for prices and discounts, or write for bulletin giving all the details.

FIRELINE STOVE & FURNACE LINING CO.
1816 N. Kingsbury St. (Dept. E) Chicago 14, Ill.

Fireline provides an efficient refractory lining within the firepot, sealing all cracks and holes in the castings.

IRONSET FURNACE CEMENT

The high-quality cement for setting up new furnaces and re-cementing old ones. Withstands higher temperatures. Will not crack, bloat, shrink, or blister. Gives a high degree of permanence to your work. Try it on your next job and watch it produce other customers for you. Packed in 5- and 10-lb. cans.

FIRE-HEARTH CASTABLE

The ideal refractory for setting stokers, sealing tuyeres, and precast combustion chambers. Also for making furnace baffles. Easy to use: Just mix with water, pour into place, and smooth with a trowel. Sets without heat. Packed in 50- and 100-lb. bags.

fluid heat gives alert fuel oil dealers plenty of talking points! . . . .

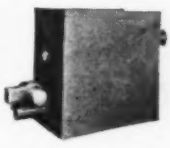
Easier to Satisfy Customers

You make more sales because the Fluid Heat Line is really complete, includes both pressure *and* rotary burners. That means you sign up more fuel oil contracts—build greater fuel oil volume!

4 Pressure Burners
Firing rates from 7/10 to 12 gallons per hour

7 Wall Flame Rotary Burners
Firing rates from 1/2 to 6 gallons per hour

2 Air Conditioning Furnaces
From 85,000 to 120,000 BTU per hour



6 Boiler Burner Units
Capacities from 475 to 840 sq. ft. of standing hot water

$ $ $ $ $ $ $

Sound and Competitive Price Structure

Savings effected in manufacturing methods *not* in materials . . . keep our prices competitive . . . fit Fluid Heat Products for every field from small homes to commercial installations.

fluid heat OIL BURNER

Since the beginning of oil heating, the Fluid Heat trademark has meant well-designed and well-constructed units, known and trusted by American consumers for fine performance.

Properly Designed and Ruggedly Built

Fluid Heat Products reduce service problems to a minimum, thus make a substantial saving in your service costs. You get sound engineering *not* spectacular gadgets with Fluid Heat. And every Fluid Heat Unit is thoroughly tested before leaving our plant.

A Top-Notch Development Laboratory

Headed by engineers long experienced in the industry, this laboratory keeps Fluid Heat Products up-to-date and ahead of competition in engineering and construction. Its facilities are devoted to giving you more convincing sales points.

THESE are a few of the things that make Fluid Heat a profitable line to handle. As a fuel oil dealer you will also be interested in our active, experienced field force. These men are always ready to help Fluid Heat Dealers in problems of service and sales. And you'll also appreciate our friendly dealer policy . . . built on the principle of building *our* business by helping fuel oil *dealers* build theirs.

Write us for full details on a Fluid Heat Dealer Franchise and information on future possibilities. Fluid Heat Division, Anchor Post Products, Inc., 6720 Eastern Ave., Baltimore, Maryland.

fluid heat OIL BURNER

"WORLD'S ECONOMY CHAMPION"

Manufactured by Anchor Post Products, Inc., Baltimore, Md., Established 1892

—IMMEDIATE DELIVERY—

PowerBilt FIELD TESTED
Attic Type Fans

10 Superior Features

1. All steel, welded construction. Body painted light gray, fan blades are painted red.
2. Fan blades latest scientific design to deliver maximum volume of air *with minimum noise.*
3. Pulley wheel, fan blades and motor precision aligned and balanced.
4. Rugged, sealed ball bearing motor. 110 Volt, 60 Cycle. Our own design.
5. High quality fan belt under automatic tension.
6. Venturi-protruding curved orifice to assure smooth air travel at maximum volume.
7. Engineered and designed for easy installation; trouble-free economical operation.
8. All moving parts rubber cushioned.
9. Six sizes:—30" to 54" wheels.
10. Guaranteed against defects in materials and workmanship.

POWER BILT

ELECTRIC MOTORS—1/3 H. P. CONDENSER TYPE—IMMEDIATE DELIVERY

Steel Plate Exhausters **Multi-Blade Exhausters** **Turbo Blowers**

Power Engineering Company is organized and equipped to design and manufacture practically every requirement in the fan, blower and exhauster field. Our facilities permit immediate delivery on stock items and speedy service on special requirements. Submit your problems to our engineering department for prompt attention.

Power Engineering Co.

361 East Ohio Street **Chicago 11, Ill.**

Engineers and Manufacturers

Reprinted from May issue of AMERICAN ARTISAN

WHEN THE GAME GETS TOUGH
you gotta have STUFF on the ball!

YES, when Mr. Buyer finds he can again "wait 'em out," selling gets tougher. That's when the dealer has to have *something to sell* and something to sell *with.* And that's when the Oil-O-Matic dealer shows his stuff ... when he has the edge.

SOMETHING TO SELL!

Oil-O-Matic dealers can offer prospects not just another high pressure oil burner, but an Oil-O-Matic based on the Low Pressure Principle. They can show how their product extracts *more* heat from *less* oil ... handles any type and grade of fuel oil without clogging. They can demonstrate how an Oil-O-Matic burns as little as 2 quarts of oil an hour, so that even the smallest home can enjoy unexcelled economy, efficiency and dependability. And to clinch the sale they can point out the fact that "with hundreds of makes to choose from, every eighth oil burner is an Oil-O-Matic."

SOMETHING TO SELL WITH!

Oil-O-Matic's Retail Sales Training School, now in operation, teaches dealers' salesmen how to really sell ... gives them powerful selling tools like the "Best Seller" Sales Manual. Oil-O-Matic provides a complete array of dealer literature, displays, and signs...plus powerful national magazine and newspaper advertising and factory-dealer cooperative advertising. In addition, Oil-O-Matic is constantly meeting new conditions with special merchandising aids such as the Preferred Purchaser Agreement plan that is enabling dealers to nail down future business *now!*

WILLIAMS OIL-O-MATIC HEATING SYSTEMS

WILLIAMS OIL-O-MATIC DIVISION, Eureka Williams Corporation, BLOOMINGTON, ILLINOIS

it's 1-2-3 WHEN YOU INSTALL THIS REVOLUTIONARY HOLLY Stubby

Unless it's a Holly it can't be a STUBBY

In addition to the STUBBY'S outstanding ease of installation, it offers the further advantages of freedom from operational worries and breakdowns, economy and long life.

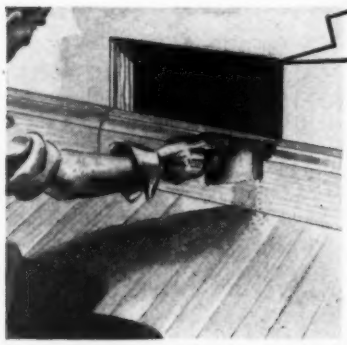
Holly STUBBY Furnaces are available now in flat and dual types from 32,000 to 57,000 BTU input. They are sold only by licensed installing dealers. Qualified dealers are invited to write for details.

ENGINEERED HEATING
HOLLY

HOLLY MANUFACTURING CO.
875 SOUTH ARROYO PARKWAY, PASADENA 5, CALIFORNIA

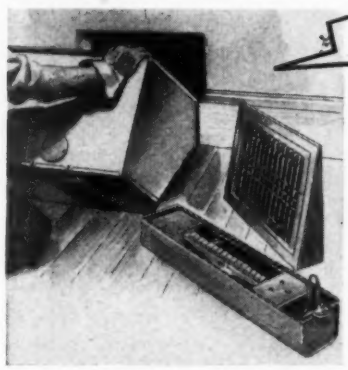
Holly's Engineered Improvements Have *Cut Installation Time* Which Means Bigger Profits For You! Here's Why:

1.



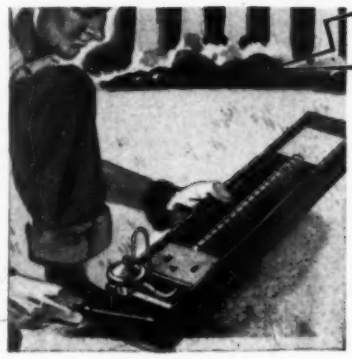
You cut a hole to exact size of the furnace. Do *not* over-size it!

2.



Slip the STUBBY through this hole from above the floor and nail to the floor joists; the finish floor is laid up to the furnace casing.

3.



The separate patented burner pan, containing all working parts, now is quickly attached to the bottom of the furnace with just 2 wing nuts. No tools required. Then connect vent and gas line to complete job.

Prescribed atmospheric conditions are assured in the nursery at Doctors Hospital, Washington, D. C., with Anemostat draftless air-diffusion.

• • • that calls for ANEMOSTAT!

Architects, engineers and air-conditioning contractors face a more intricate problem in hospital air-conditioning than in many other types of installation. In hospitals they must meet atmospheric requirements which vary with each of the services. For example, in nurseries for premature-born infants, air-conditioning must contribute to the constant stabilization of the babies' body-heat (because their thermal regulating system is not yet fully developed) by equalizing temperature and humidity in the nursery. In operating rooms sterile air must be delivered—not only sterile—*but without drafts*. And so on, through the general wards, isolation wards, private rooms, offices, waiting rooms, etc.—each requiring its own specific atmospheric conditions.

Air-conditioning experts agree that an air-conditioning system can never be better than its air-distribution. That is why *draftless* air-diffusion — through Anemostats—is the answer to air-conditioning problems.

Anemostat air-diffusers distribute conditioned air in pre-determined patterns, assuring uniform air-changes throughout the room. Anemostats eliminate drafts . . . prevent dead air pockets . . . equalize temperature and humidity. And—they operate *silently*. The installation in the Doctors Hospital at Washington, D. C., again proves that Anemostats provide the air-diffusion required in hospital air-conditioning.

If you have an air-distribution problem, an Anemostat engineer can help. Ask your Architect or Engineer to arrange a consultation. There is no obligation.

Write for full details!

PROMPT DELIVERIES All Anemostats are especially designed to solve individual air-diffusion problems. However, the great variety of types that have been developed and standardized, permits us to assure prompt delivery from stock.

AC-1076

ANEMOSTAT

REG. U. S. PAT. OFF.

ANEMOSTAT CORPORATION OF AMERICA
10 East 39th Street, New York 16, N. Y.

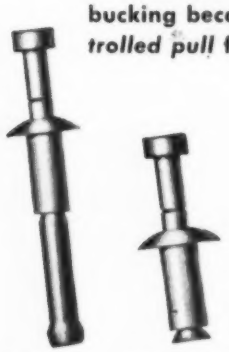
REPRESENTATIVES IN PRINCIPAL CITIES

"NO AIR-CONDITIONING SYSTEM IS BETTER THAN ITS AIR-DISTRIBUTION"

There are *too many hands*
and *too many tools* in this picture

Because*...*one hand* and *one tool
do your fastening job better!

CHERRY BLIND RIVETS reduce pounding hours to fleeting minutes. There's no hammering or bucking because they are installed with a *controlled pull* from *one side* of the work only.



High-strength, self-plugging type Cherry Blind Rivet

Tight-clinching, pull-through hollow type Cherry Blind Rivet

A SIMPLE ONE-HAND OPERATION vs. a tough two-man job. Installing a Cherry Blind Rivet is a fast, one-hand operation requiring only three simple steps: (1) inserting rivet in hole; (2) engaging the rivet; (3) actuating the gun. This adds up to speed, speed, speed.

TIGHT, STRONG JOINTS — Cherry Blind Rivets have (a) greater shank expansion and (b) greater allowable variance in material thickness . . . than any other blind fastener. This means uniformly tight, strong joints under actual shop conditions where hole sizes and sheet thicknesses cannot always be controlled closely.

CHERRY RIVET USERS know what low-cost, secure fastening really is. Cherry Rivets have no substitute for blind or hard-to-reach spots . . . and any fastening job, blind or otherwise, is finished in less time with less cost.

Get this Cherry illustrated manual. Write to Dept. E-200, Cherry Rivet Co., 231 Winston St., Los Angeles 13, Calif.

Cherry Rivet
Company
LOS ANGELES 13, CALIFORNIA

CHERRY RIVETS. THEIR MANUFACTURE & APPLICATION ARE COVERED BY U.S. PATS. ISSUED & PEND.

You know where HEATWAY prospects live *because their coupons tell you*

Month after month, national advertising gets leads in your neighborhood.

LEADS FOR YOU are a Heatway specialty.

A good product is no good to you in the warehouse. So we concentrate on moving Heatway appliances *out* of your stock, not *into* it.

National advertising is aimed at getting leads. We don't just keep the Heatway name before the public. We get the public's names for *you*...

An interested prospect is half the sale!

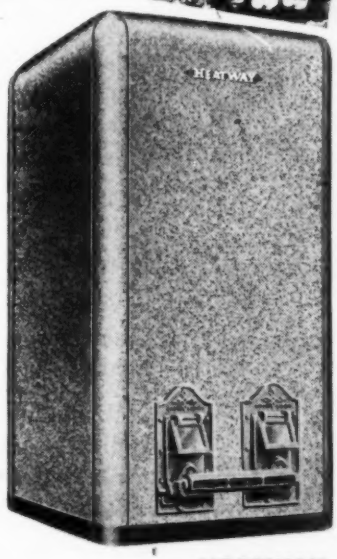
Every ad carries a coupon or offers free literature.

And *every* inquiry is turned over to the nearest Heatway dealer.

That's how the Heatway Franchise can put you in the money...with *actual interested leads.*

Cut through competition by selling to *selected* prospects.

Use the coupon below today. Let a Heatway representative tell you the story of secure profits.



HEATWAY *STOKERMATIC*

The Franchise that brings you **LEADS**

HEATWAY
570 Lexington Avenue, New York 22, N. Y., Dept. A-3

I'm interested in leads. Tell me all about the Heatway franchise.

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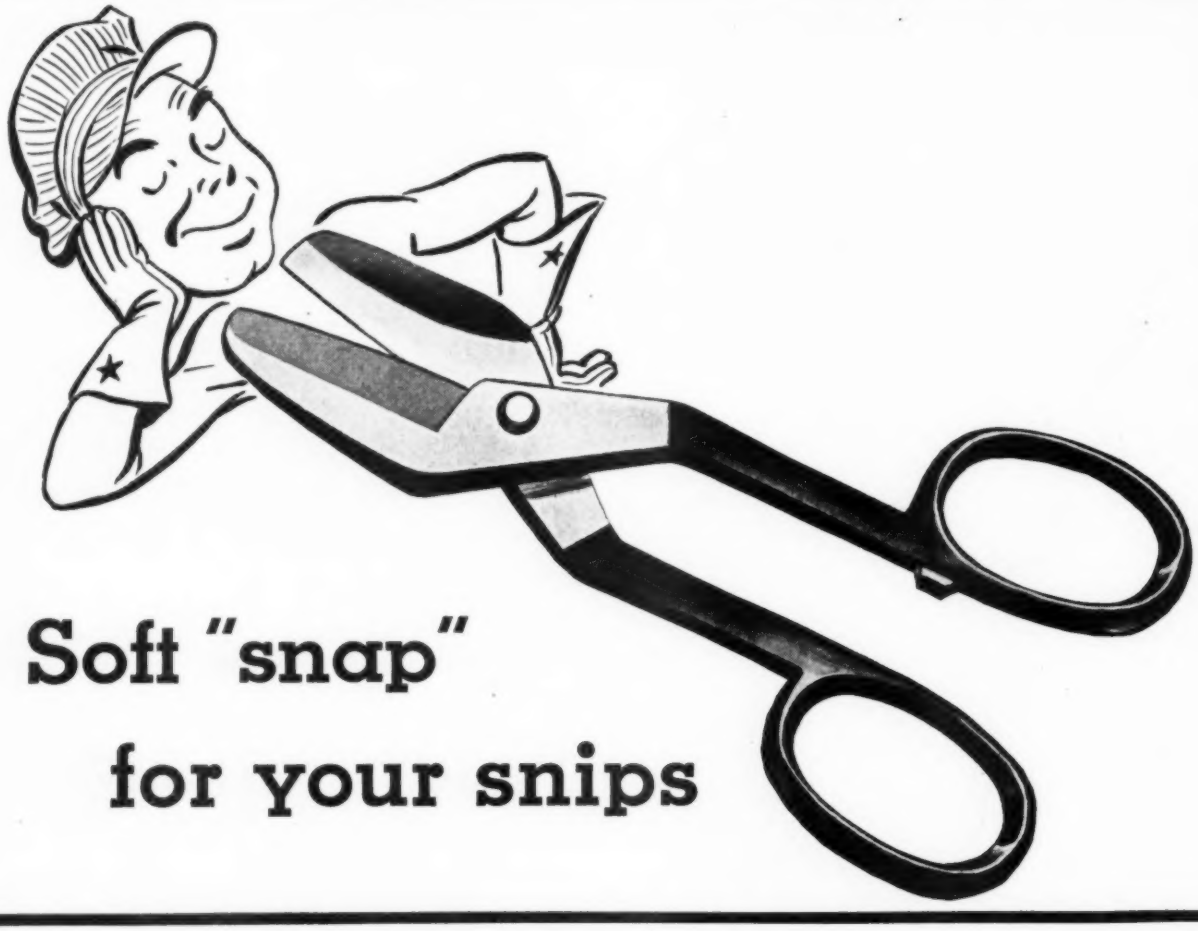
CITY ..... STATE .....



Soft "snap" for your snips

Clean-cutting Galvanized ARMCO Ingot Iron sheets have been a favorite with shop men for forty years. They know that this highly refined metal has what it takes for even the most complicated sheet-metal work.

Because it is ***soft and ductile*** ARMCO Ingot Iron is easier to work than ordinary sheets. It follows a pattern easily and smoothly, and once formed holds its shape.

And ARMCO Ingot Iron is ***consistently uniform***—both as to base metal and galvanized coating. That's because the most efficient and exacting control methods are employed in its production.

These qualities add up to less shop time, reduced scrap-losses, and extra profit for you. And the familiar ARMCO triangle trademark assures customer acceptance and lasting satisfaction.

Today Armco mills are rolling 'round the clock to bring you more of this and other ***special-purpose*** iron and steel sheets. So be sure to keep in touch with your Armco Distributor and his stock situation. The American Rolling Mill Company, 761 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

MADE OF ARMCO INGOT IRON

THE AMERICAN ROLLING MILL COMPANY

- SPECIAL-PURPOSE SHEET STEELS
- STAINLESS STEEL SHEETS, STRIP, BARS AND WIRE

WILLIAMSON
TRIPL-IFE GRAVITY FURNACES

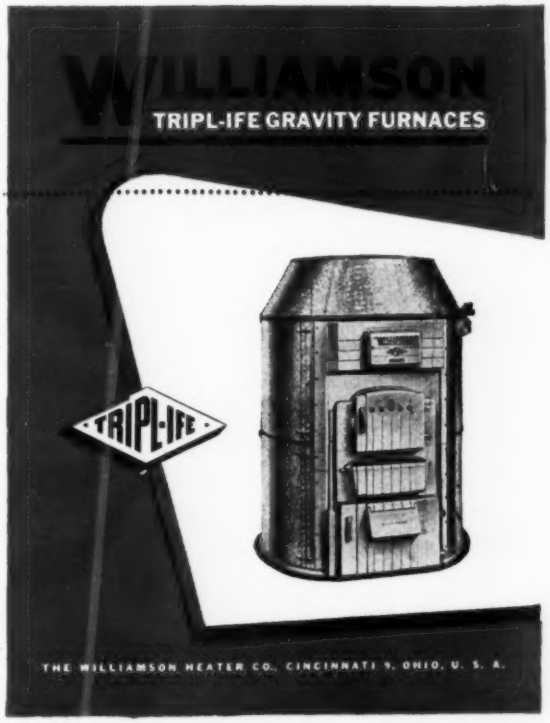
guaranteed 20 years*

NOW—Williamson Tripl-ife Furnaces are available again. During 1946, while shortages retarded production Williamson Tripl-ife furnaces were, in all fairness, allocated to our established accounts.

With improved availability of materials and increased production we are pleased to again offer Tripl-ife to the Trade generally.

Here is a line that meets the preference for Cast Iron Furnaces and, because of its many exclusive features, backed by the Williamson 20-Year Guarantee, enables you to sell a better product and net a better profit.

Your request will bring complete information. Just ask for catalog AD-G12.



TRIPL-IFE

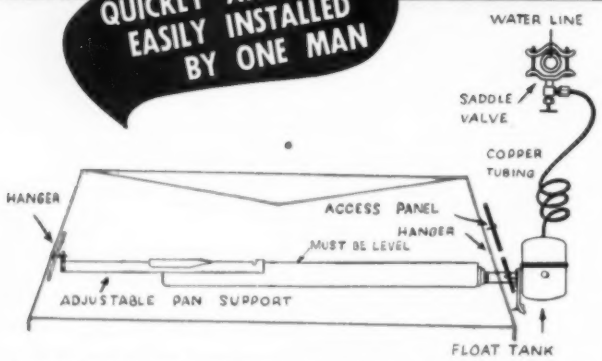
THE WILLIAMSON HEATER COMPANY, CINCINNATI 9, OHIO

Another VIKING profit builder the Series 1900 Humidifier . . .

Specially Designed for Gravity Heating Systems

. . . where space is not a critical factor. The Viking Series 1900 Humidifier is an all copper, V shaped unit with over 200 sq. in. of exposed water surface . . . providing adequate evaporation (humidification) for any size gravity heating system.

QUICKLY AND EASILY INSTALLED BY ONE MAN



The VIKING Series 1900 Humidifier is equipped with a telescopic pan support and will fit all sizes of bonnets or plenums. No special tools are required for the installation. Simply drill the front of the bonnet for a ½" pipe nipple . . . attach the front and rear hangers with sheet metal screws . . . install the humidifier pan and couple the float tank . . drill a ⅜" hole in a convenient water line and install the saddle valve . . . connect the saddle valve to the Viking Top Seat Float Valve in the float tank and the installation is complete. A 4" or 5" hole cut just above the float tank will facilitate installation. A plate is furnished for use as an inspection door for occasional checking.

Make an EXTRA Profit on every Furnace Cleaning Job

Any householder interested in having his furnace cleaned or re-set is easily sold the VIKING Series 1900 Humidifier. Requires little, or no additional time to install while your working on the furnace. Assures your customer all-season, automatic humidification. Costs you only $8.95, easily worth $15.00 to any discriminating householder. Carry one with you on every call.

NOW is the time to CASH IN on this item

While your customers are conscious of their furnace requirements . . . when they're getting set for the heating season ahead. Write today . . . get complete information all VIKING Humidifiers . . . or, better still . . order enough Series 1900 Humidifiers to take care of your present requirements. Immediate shipment from stock, or from your jobber.

MAIL THE COUPON *Today*

Viking FOR EXCELLENCE

AIR CONDITIONING CORP. 5600 WALWORTH AVE. CLEVELAND 2, OHIO

Gentlemen: Please ship at once
_____VIKING SERIES 1900 HUMIDIFIERS at $8.95
NAME_____
ADDRESS_____
CITY_____ZONE____STATE_____
☐ Bill thru my jobber ☐ Check enclosed
My Jobber is_____
☐ Send Viking Humidifier Bulletin JD 313

New Literature

For your convenience in obtaining copies of New Literature use the coupon on page 132.

76—"Night Cooling"

An illustrated folder that advocates the application of the night-cooling process to the industrial plant is being mailed out by Ilg.

The average factory is notorious for its poor ventilation in the summer months and much of this trouble could be solved by the use of fans to draw cool, nighttime air into the plant and exhaust the smoke and stale odors that accumulated during the day.—*Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago 41, Ill.*

77—"Aluminum Finishes"

As a move toward acquainting the user of aluminum with the many finishes that are possible on this versatile metal the Reynolds Metals Company has published "Finishes For Aluminum" in two volumes. The first volume deals with cleaning treatments and then goes into the mechanical surface finishes as well as the chemical surface finishes that are adapted to use on aluminum. Special finishes also are considered in this volume.

Section two is a loose leaf booklet that contains a great deal of shop data on materials, equipment, solution preparation, procedure and control for most of the finishing processes. It is planned to issue new bulletins from time to time to keep this book up-to-date. Price $2.00—*Reynolds Metals Company, Dept. 27, 2500 S. Third St., Louisville 1, Ky.*

78—"Counterflo Heater"

A new bulletin describes the Dravo Counterflo Heater that is designed for industrial and commercial use. It outlines the application of stainless steel to the combustion chambers used in this self-contained direct fired, warm air heating unit. It also discusses the combustion efficiency of the unit, its fuel convertibility and the elimination of refractory material within the combustion chamber—*Dravo Corporation, Pittsburgh, Pa.*

79—Air Conditioning Book

"New Industrial Dimensions" are provided by air conditioning according to the thesis advanced by General Electric in the latest publication of its Air Conditioning Department. The booklet is colorfully illustrated and pictures many actual installations of air conditioning that affect production processes and show that the expense of the air conditioning system may be more than offset by the possible gains in tool and equipment life, increased productivity, reduced maintenance and other like results.—*Air Conditioning Department, General Electric Co., Bloomfield, N. J.*

NEW STAINLESS STEEL
COMBUSTION CHAMBER
INTRODUCED BY DRAVO
PITTSBURGH, PA.: Stainless steel, scientific development which aided the advancement of jet propulsion and turbo-supercharging is now being utilized to provide more efficient and durable combustion chambers in Dravo Counterflo Oil and Gas Fired Heaters. Effective immediately, industrial and commercial heating installations with Dravo Heaters

• In fabricating the combustion chamber of Dravo Heaters from stainless steel, many extra years of highly efficient operation have been added to the life of a direct fired heater that already has proved its worth in thousands of industrial and commercial installations.

The most vulnerable part of any heater is its combustion chamber. It is here that scale from high combustion temperatures first causes inefficiency and later failure. Stainless steel has high resistance to oxidation. This revolutionary application of high heat-resisting metal will not only prolong the life of the Dravo Heater, but will aid in maintaining its inherently high efficiency.

Other advantages gained in this important advancement include: **elimination of refractory with its troublesome maintenance; reduction of overall size and weight of heaters; more flexibility of application and over 100% greater safety factor against burning out when compared with carbon steel.**

These and other improvements make the Dravo Counterflo Oil or Gas Fired Heater the most efficient and durable heater of its type available today. Write for Bulletin DC-516 for details. Dravo Corporation, Heating Section, 300 Penn Avenue, Pittsburgh 22, Pa.

DRAVO CORPORATION

PITTSBURGH · PHILADELPHIA · CLEVELAND · NEW YORK · DETROIT
WASHINGTON · ATLANTA · WILMINGTON

New Literature

For your convenience in obtaining copies of regarding these items, use the coupon on Page 132.

80—Material Situation

Apparently Minneapolis-Honeywell can see no relief in the material situation so they have decided to go in for comic relief. A small booklet has been prepared which makes use of humorous artwork and doggerel to present the story of the material shortage. Copies are available.—*Minneapolis-Honeywell Regulator Company, Minneapolis 8, Minn.*

81—Clean Up With This!

A mailing piece which is being sent to dealers describing the profits that may be garnered by use of the Tornado furnace cleaner has been developed by Breuer. It gives specifications and tells of the operative features of this particular furnace cleaner.—*Breuer Electric Mfg. Co., 5100 Ravenswood Ave., Chicago 40, Ill.*

82—Want to Weld?

"Learning To Weld" is a booklet that has as it's purpose teaching how to weld and apply arc welding to the repair of broken parts, the hard surfacing of worn parts and the building of miscellaneous equipment.

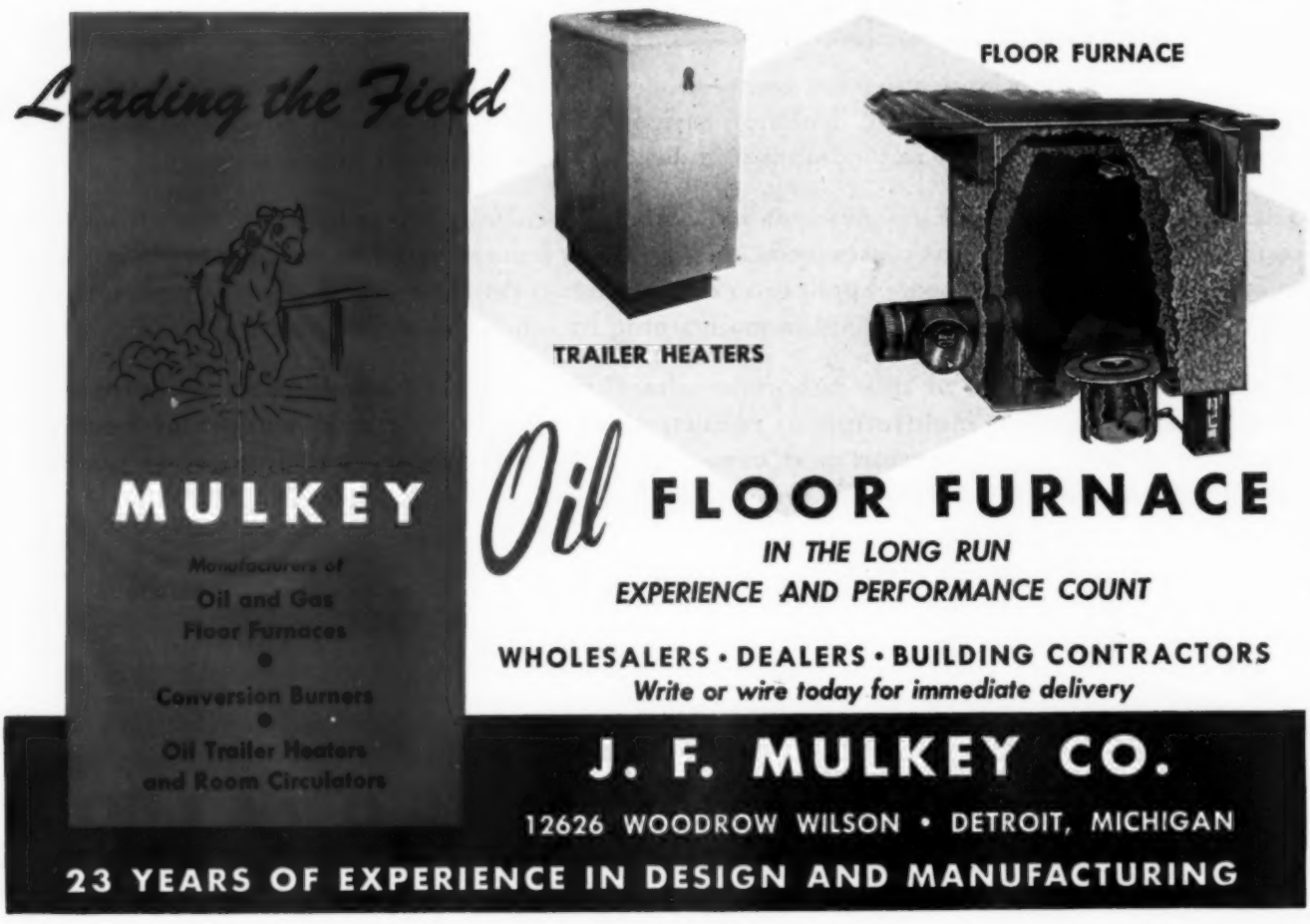
Subjects treated are: protective clothing and equipment; striking the arc; various welding positions; types of weld and other like matters.—*The Lincoln Electric Co., Cleveland, O. Price 25c.*

83—"Sealed Heat"

"South Wind Sealed Heat" is the title of a new piece of consumer literature that has been developed by Stewart-Warner. It gives a description of the new "Midget" furnace and also demonstrates the ways in which the units may be utilized in heating the home. —*Stewart-Warner Corp., 1514 Drover St., Indianapolis, Ind.*

84—Condensation

Latest circular of the Small Homes Council of the University of Illinois is one on a topic of interest in these days of weather-tight homes—"Moisture Condensation." This is a problem that is not generally encountered in older houses because their porous and uninsulated walls allow the moist warm air to pass right thru. But insulation, whether used in an old or new house, while preventing heat loss brings up the difficulty of condensation when the moist warm air meets the cold surface of the insulated wall. For this reason it is necessary to install a vapor barrier and the circular delves into all the "whys and wherefores" of the vapor barrier.—*Small Homes Council, Mumford House, University of Illinois, Urbana.*



Welding Helps Us Grow

By Wm. J. Mathis, Partner,
Geo. E. Mathis & Son, Chicago, Ill.

DURING the past 10 years, our business has grown from a small "tin shop" to a good-sized metal-fabricating and manufacturing concern. We attribute much of this progress to the flexibility and economy of the arc welding process. Our next step in our expansion will take us into an additional new building with modern fabricating equipment.

Fig. 1. Motor bases and stands for a conveyor.

Our present equipment includes an 8 ft.-3/16" roll, a 12 ft.-3/16" power brake, a 10 ft.-10 ga. press, a 10 ft.-10 ga. square shear, cutting equipment, a 20 KVA spot welder and two Lincoln Welders. This indicates the range of work that we are able to handle.

The conveyor stands shown in Fig. 1 are part of an installation 45′ long, 30″ high, 15″ wide. The stand frames are made, for the most part, from 1½″ square tubing as shown in Fig. 2. Feet are segments of a circle

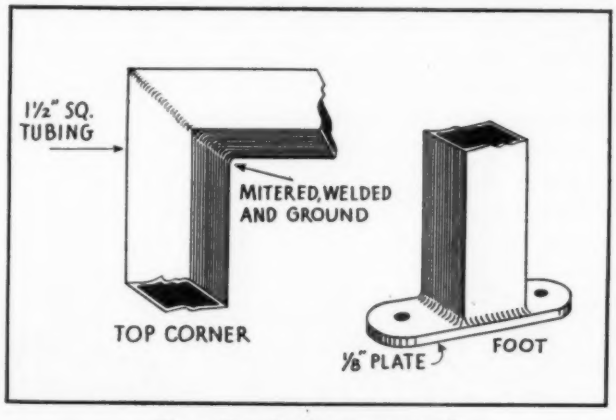


Fig. 2. Details of conveyor stand.

Fig. 3. Weatherproof switchboard cabinet.

of ⅛" plate with sides squared off to prevent extending out into aisle. These feet are fillet welded to the legs, all around. Motor stands (at left in Fig. 1) have sides and shelves of 3/16" plate with flame-cut openings.

The cabinet shown in Fig. 3 is a 10′ x 7′ x 3′ weatherproof housing for electrical switching equipment. It is made of 10 ga. steel with brake-formed ribs for reinforcement. View at the right shows conduit entrance on top and door construction. Hinges are welded on.

The cone hopper shown in Fig. 4 is part of a dust-

Fig. 4. Welding a cone hopper for a dust collector.

collecting system—typical of some of the installation work which we do. Arc welding enables us to use a maximum amount of shop fabrication and thereby cut costs.

We use Lincoln "Fleetweld" Electrodes in practically all of our work with procedures essentially as described in the "Fleet-Welding" Manual (Bul. 440). This is available by writing THE LINCOLN ELECTRIC COMPANY, Dept. 173, Cleveland 1, Ohio.

Advertisement

New Literature

For your convenience in obtaining information on "Equipment Developments" and "New Literature" use this coupon.

5-47

American Artisan,
6 N. Michigan Ave.,
Chicago 2, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "Equipment Developments" and "New Literature." (Circle numbers in which you are interested):

49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64
76	77	78	79	80	81	82	83
84	85	86	87				

Name .....

Company .....

Address .....

Are you manufacturer? ☐ Jobber? ☐ Dealer? ☐

85—Dust Collectors

A new illustrated booklet published by American Air Filter covers their Type D dynamic precipitator, a device that is especially designed for the collection of most kinds of granular industrial dust. Illustrations give views of the parts and attachments of these precipitators and capacity and dimension tables are included.—*American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky.*

86—Drop Hammer

The "Cecostamp" an air-operated drop hammer is described in a bulletin recently issued. This hammer was designed to form sheet metal parts by impact and during the war its use was confined to airplane parts. Now however it is being used in the formation of bus and auto panels and other uses which require the forming of stainless steel and aluminum alloys.

Sizes range from a die area of 15" by 12" to 120" by 120".—*Chambersburg Engineering Co., Chambersburg, Penn.*

87—Punch Catalog

The Wales Type "CD" hole punching units are the subject of a catalog released recently. These units are independent self-contained punches that are available in diameters up to 1⅛" and will penetrate ⅛" mild steel.

The catalog pictures the various sizes and shows the method of application to individual punching problems.—*Wales-Strippit Corp., 345 Payne Ave., North Tonawanda, N. Y.*

LOOK
FOR THESE FEATURES
IN AN
EVAPORATIVE COOLER

SNO-BREZE

COOLERS
HAVE THEM ALL

Rust proof steel water pressure regulator

Clog proof adjustable drip system

Vibration proof silent blower

Rustproof steel or aluminum die drawn panels

12 gauge cross torque blower and motor support

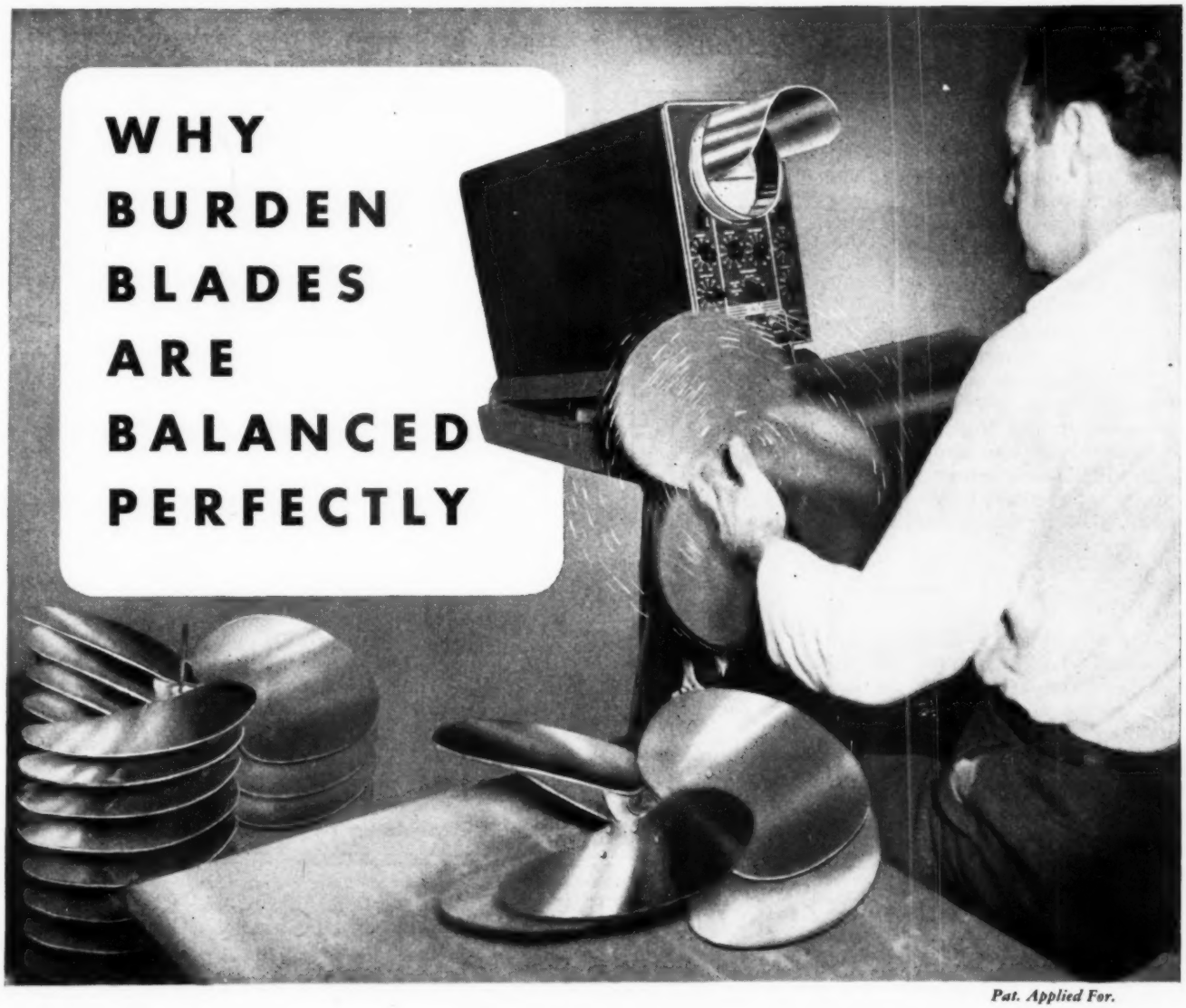
Slip proof pad holder

Sno-Breze coolers are backed by 38 years of Palmer engineering know-how. They're made, tested and perfected in the toughest proving ground in the world — the Arizona desert!

Illustrated: Horizontal blast blower model. Can be installed on roof or on outer wall. A complete size range for any size building — 2,500 to 20,000 CFM.

Palmer
Manufacturing Corp.
Phoenix, Arizona

WHY BURDEN BLADES ARE BALANCED PERFECTLY



Pat. Applied For.

THERE'S no guess work in balancing Burden Blades! It's all done by means of a new and exclusive electrical device designed by Burden engineers. This balancer consists of a powered mechanical head and a cathode ray tube mounted on a stand. Propellers are placed on the balancer and rotated under test. Any vibration caused by either dynamic or static unbalance is picked up by the balancer head and translated electronically into a visual indication on the screen of the cathode ray tube. The screen is calibrated to show precise correction necessary to eliminate all vibrations.

This perfect balancing of Burden Blades assures you full air volume, quiet operation, smooth running. In short, better performance over a longer life span.

Wherever propellers are needed, use scientifically balanced Burden Blades.*

Attic Fan Blades — *Semi-Pressure Type Blades*

Pressure Type Blades — *Free Air Fans*

Burden COMPANY

Write today for Literature

1000 N. ORANGE DRIVE • LOS ANGELES 38, CALIF.

Canadian Representative: SILVER BROTHERS CO. 7-11 Mary Street Hamilton, Ontario

With the Manufacturers

Paul B. Sagar is sales and service education engineer for Norman Products Company of Columbus, manufacturers of gas fired heating equipment.

P. B. Sagar

Mr. Sagar has a wide background of experience in the field, coming to Norman from General Controls where he had been handling sales organization and service education in the Rocky Mountains. He had also been with Iron Fireman and spent two years with the testing laboratories of the American Gas Association.

A new company has been formed in the heating equipment field that is to be known as the Heatcraft Company and is headed by H. E. Culley. General offices of the new concern are located in the Vaughn Building, Louisville, Kentucky.

The new company plans to produce a complete line of gas burners, oil burners, stokers, blowers and furnaces fired by gas, coal and oil thus setting up a full line of equipment for national distribution.

Maurice H. Klett has become assistant to the sales manager of the Henry Furnace Company of Medina, Ohio, producers of Moncrief warm air furnaces and air conditioning units, furnace pipe and fittings.

M. H. Klett

Mr. Klett had spent many years with the Fox Furnace Company of Elyria, Ohio, and had represented that company in the Southwestern territory. He had also previously been associated with several of the men who hold top executive positions with Henry Furnace.

Frank E. Kise has culminated his long career with Williamson Heater Company of Cincinnati by recently being named general sales manager of the company. His employment with the company dates back to 1903 when it was the Peck-Williamson Company. Taking time out to acquire an engineering degree at Purdue Mr. Kise returned in 1908 when the present name was acquired by the company and he has occupied positions of increasing responsibility ever since.

F. E. Kise

Now Only $2.00 for This Outstanding Book on Air Conditioning

The Third Edition of

AIR CONDITIONING FOR COMFORT

by SAMUEL R. LEWIS

288 Pages—6½"x9¼"—Cloth Bound

Easy to understand . . . accurate . . . comprehensive . . . these are the features of this third edition of Samuel R. Lewis' well-known AIR CONDITIONING FOR COMFORT.

Fundamentals are fully and clearly covered. Correct procedure in designing complete systems for both residences and large buildings is explained step by step. In addition, considerable original data on such subjects as standards, noise control, measurements, and fire protection codes has been included.

Send $2.00 for a copy today to the address below. We know you will consider this one of the finest air conditioning book you have yet seen, but if you should be dissatisfied with it for any reason whatever, your money will be promptly returned to you.

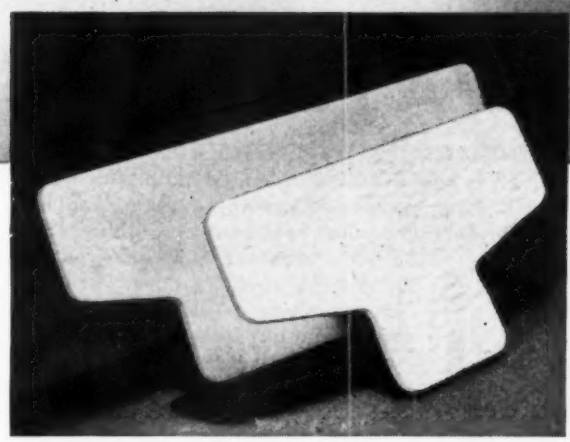
KEENEY PUBLISHING COMPANY

6 No. Michigan Avenue Chicago 2, Illinois

"...and the plans include a *Skuttle Automatic Humidifier!*"

IT'S not the heat; it's the *lack* of proper humidity that makes so many winter homes "feel" downright dry and uncomfortable. That's why *Skuttle Automatic Humidifiers* are being specified as an important integral part of the regular furnace equipment in more and more of today's new homes as well as in many existing and replacement installations. Readily adaptable to all types of furnaces, these efficient, self-servicing units completely eliminate the objectionable "dryness" common to artificial heat by moisture-conditioning the air to the proper relative humidity for cleaner, healthier, more comfortable living.

They're well-built, too, for a long and useful life . . . with a pure brass and copper water tank and valve assembly, drawn steel vitreous enamel pan in 12″ to 28″ sizes, adjustable collar to fit either sloping or vertical bonnets, and large inspection door and frame. See your local jobber or write for state listings and the complete Skuttle story!



Replaceable VAPOGLAS* Evaporating Plates!

Skuttle's new VAPOGLAS is a revolutionary development in the home humidification field. More efficient, more durable, more economical, replaceable VAPOGLAS evaporating plates hold almost 70% more water than the ordinary brick ceramics, yet they're 60% thinner and offer proportionately less resistance to air flow across them. Made of 100% pure glass by a special process and die cut to exact uniform shape.

*Exclusive Trademark Registered U. S. Pat. Off.

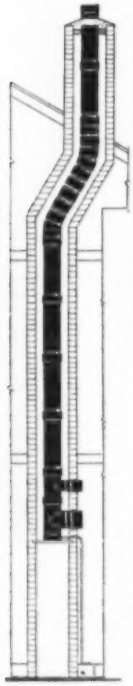
More Sales Ahead . . . for Clean, Comfortable **HUMIDIFIED AIR!**

Skuttle Mfg. Co.

4099 BEAUFAIT • DETROIT 7, MICH.

AVAILABLE!

CONTRACTORS—Yes, VITROLINER CHIMNEY LINER is now available in limited supply for lining old or new masonry chimneys—insuring long life and protection against acid bearing CONDENSATION. Ideal for oil or gas fired heating plants because Vitroliner is made of heavy gauge steel completely coated inside and out with acid resisting porcelain fused into the steel at 1575° F. to prevent corrosion. Vitroliner drains the condensate harmlessly away into the ground preventing deterioration of brick work.



VITROLINER will correct DEFECTIVE LINING, SMOKE BACK, LEAKY BRICK JOINTS, and POOR DRAFT.

VITROLINER has been used for the past 18 years and is proven through a long field record.

DEALERS WANTED
A PROFITABLE BUSINESS

You can quickly build up a thriving business lining chimneys. We invite correspondence from reliable dealers who can maintain Vitroliner chimney lining stock —contact and service installations in cities. Write today for literature and prices.

Write for Further Details.

Condensation Engineering Corporation

122 SO. MICHIGAN AVE. CHICAGO 3, ILL.

With the Manufacturers

The photograph above shows part of the fleet of trucks of the C. H. Ruebeck Company of Waco, Texas, a builders specialties wholesaler that entered the roofing and sheet metal business about twenty years ago. During the war they offered their services to the government and their sheet metal department expanded to the point at which they were employing as many as 600 people.

Once the war was over there was some slump, of course, but they are keeping their sheet metal section busy on industrial and ventilating work.

The roofing department has had little let-up 'though they have been troubled with a shortage of materials and as the hard building materials come back into supply expansion is expected in that section. The future for the construction industry in that part of Texas seems to be very bright and especially in the field of commercial building.

The Stoker Division of the Pocahontas Fuel Company, Inc., is expanding its retail distribution setup in the Cleveland and Detroit areas for the marketing of the O. P. Pipeline Stoker. Retail dealerships will be offered to interested coal dealers in those areas. The company will continue to maintain its retail branch service departments.

H. E. Williams has been promoted to the eastern regional sales managership of the heating controls division of Minneapolis-Honeywell Regulator Company. Mr. Williams had been in the company's aeronautical division during the war and spent much of his time in England training Air Force personnel in the use and maintenance of electronic automatic pilots and turbo supercharger regulators. He succeeds H. E. Chapler, who is now in the general offices in Minneapolis.

H. E. Williams

At the same time Reginald C. Cushing became sales manager of the air conditioning controls division for the Pacific region of the company. Mr. Cushing has been with M-H since 1935 and will make his headquarters in the San Francisco offices at 1136 Howard.

★ Formerly manufactured by us as MARINE OIL BURNER.

LEADING THE PARADE OF DEALER PROFITS

Your Customers Like Them . . . Marine Can Supply Them. This combination means profits for you,—PROFITS NOW. Ross Oil Burner assures you of prompt delivery, protected franchise, and a burner that sells.

We want dealers . . . the public wants burners. You can sell . . . we can deliver. Write us about the valuable franchises available for ROSS OIL BURNERS.

ECONOMY
Efficient mixture of oil and air burned in cylindrical fire pattern delivers more heat from less oil. Easily serviced.

SILENCE
Balanced one-piece fan. Firm level support of adjustable base and precision construction wipe out vibration and noise.

LONG LIFE
Extensive use of one-piece cast aluminum, sound design, quality parts and sound craftsmanship assure long trouble-free life.

The Public Wants These Features—ROSS OIL BURNER has them.

Depend on the Production Leader of 1946 to Supply You This Season

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Hammers Down Costs On Jobs Like This!...

B & D Hammer channeling in concrete floor.

YOU'LL find the Black & Decker Electric Hammer a handy tool for plenty of the installation work you're now doing slowly and laboriously by hand. With this high-speed, hard-hitting tool you can drill holes in concrete, stone, brick or masonry for installing air conditioning ducts and piping . . . channel in concrete flooring to conceal pipes, conduits, etc. . . . handle over-head work a lot more easily.

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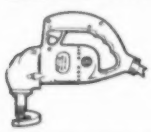
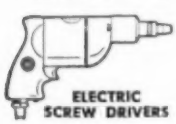
PORTABLE SANDERS



ELECTRIC SHEARS



ELECTRIC SCREW DRIVERS

ASK your nearby Black & Decker Distributor today about this time-saving tool. Black & Decker Hammers are amazingly husky, yet light in weight, and completely self-contained. Operate from A.C. or D.C. outlet or portable generator. Require no transformer or extra equipment. Powered by special, Black & Decker-built Universal motor that delivers thousands of sharp, positive hammer blows per minute. For details on Hammers and many other Portable Electric Tools for heating, piping and air conditioning work, write for our catalog to: The Black & Decker Mfg. Co., 682 Pennsylvania Ave., Towson 4, Md.

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Black & Decker

PORTABLE ELECTRIC TOOLS

With the Manufacturers

There have been two additions to the Master Kraft Oil Heating factory field force, in two different areas. Charles S. Reynolds of Utica, New York, will cover upstate New York from Albany to Buffalo. Mr. Reynolds left the International Heater Company to join Harvey-Whipple and has a background of both engineering and field sales work.

C. S. Reynolds G. W. Laird

The states of Michigan and Indiana will be the territory of George W. Laird of Paw Paw, Michigan. Mr. Laird has considerable experience in the oil burner and heating field and had previously covered the states selling plumbing and heating supplies.

International Metal Products Company of Phoenix, Arizona recently commenced operations in a new 30,000 sq. ft. factory where it will produce evaporative cooling equipment, gas heating and air moving equipment and will also fabricate sheet steel metal products. This new plant will employ 225 workers when operating at capacity.

International is an outgrowth of the Goettl Brothers Metal Products Co. which dates back to 1939. Positions of the brothers in the new organization are: general manager, A. D. Goettl; production and plant manager, Gust Goettl and plant superintendent, John Goettl.

E. W. Heffernan is the manager of the new Philadelphia office of Wheelco Instruments Company of Chicago. This new office is located at 424 Olney Ave., Philadelphia 20.

The 8th International Heating and Ventilating Exposition is to be held in Grand Central Palace, New York, from February 2nd to 6th, 1948.

When the time and location of the Exposition were announced recently there was an immediate demand for space, to such an extent that the first two floors were taken and part of the third.

Sponsored by the American Society of Heating and Ventilating Engineers the Exposition will run concurrently with the Society's 1948 meeting.

Certified Furnace Company has R. W. Thorne as its factory representative in the territory of Michigan, exclusive of the Upper Peninsula and the State of Illinois exclusive of the Chicago Metropolitan area. Mr. Thorne is no stranger to jobbers in the warm air heating field since he has been handling an associated product for some time.

ANOTHER NiAGARA BULL'S EYE!

WINTER AIR CONDITIONER FOR THE SMALL HOME

Scored by

The New NiAGARA 10-75VAC Gas-Fired WINTER AIR CONDITIONER

MODEL 10-75VAC

with front panel removed for easy access to enclosed controls.

for UTILITY ROOM, APARTMENT OR BASEMENT INSTALLATION

In all Niagara's 55 years of manufacturing residential heating equipment, never before has a new development been so enthusiastically received as the new Model 10-75VAC Gas-Fired Winter Air Conditioner—"the 'come-packed' heating unit for the compact house." Today, more than ever, when you associate with Niagara, you associate with success.

Designed especially for installation in utility rooms and apartments and suitable for basement installation, Model 10-75VAC is only 21″ wide and 32½″ deep at the base (draft hood extends 7¾″ at right, making over-all width 28¾″). Combustion chamber, side radiator and flue pipe are made of heavy Toncan iron. Blower, filter and enclosed controls are readily accessible through removable front panels. Air inlet may be located at back, either side or bottom. Output at bonnet 60,000 BTU. Burners for natural, manufactured or mixed gases. The unit is shipped as a package unit, completely assembled.

A Worthy Member of a Great Family

The complete Niagara line includes both gas-fired and coal-fired winter air conditioners and gravity furnaces for any domestic installation—furnaces which over a period of more than half a century have earned an enviable reputation for efficiency and economical operation. Write for bulletin "Associate with Success—with Niagara!"

NIAGARA FURNACE DIVISION

THE FOREST CITY FOUNDRIES COMPANY

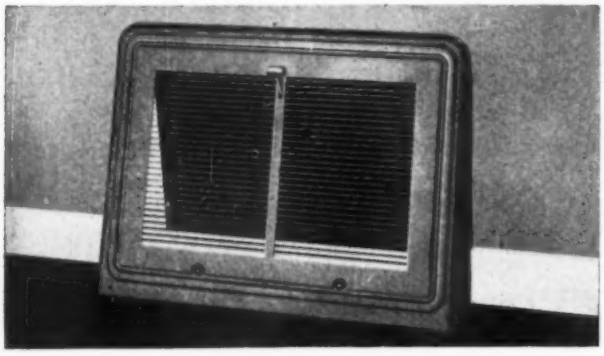
2500 WEST 27TH STREET • CLEVELAND 13, OHIO

NiAGARA

GRAVITY AND WINTER AIR CONDITIONING UNITS

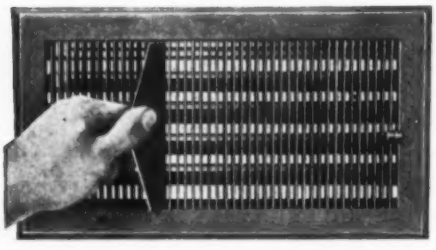
PRODUCTION INCREASING
QUALITY MAINTAINED

The production picture improves each week. Definite progress is being made on the backlog of orders and current orders. This is being done without cheapening materials and workmanship. The registers you get in your shipments will be as good or better than the U. S. standard pre-war quality.



No. 40 SERIES
GRAVITY BASEBOARD REGISTERS

"Warm the floors—people live on the floor, not on the ceiling" . . . is a sound heating principle. This can best be done with No. 40 Series U. S. Baseboard Registers. They are smart and modern in design. There are no loose screws to be lost . . . installation cost is less . . . centers easily removed or attached with engaging buttons . . . horizontal bar design hides interior and gives perfect directional-flow Indoor Comfort.



No. 256
4-WAY FLOW
A-C REGISTERS

You can master any heating situation—no matter how difficult—with U. S. No. 256 Air-Conditioning Registers. Multiple valves provide an even flow of air—up or down—as set by knob at right. Left or right directional flow is quickly adjusted by the handy grille bar setting wrench.

SEND TODAY FOR YOUR 1947 CATALOG

UNITED STATES REGISTER CO.
BATTLE CREEK, MICHIGAN
MINNEAPOLIS • KANSAS CITY • ALBANY

With the Manufacturers

The Majestic Company of Huntington, Indiana, makers of warm air furnaces, fireplace circulators and other metal specialties, have resumed publication of their pre-war house organ—Building Necessities News.

The fall-winter issue that was printed recently reported the story of the expansion of production facilities by the Majestic Company. Plant capacity and size are now twice that of five years ago and the photo with this item shows part of the new addition to the main building, in the background.

Also featured in the publication are items of interest to Majestic dealers as well as displays of the various Majestic metal products. There is a section of current humor and a discussion of delivery prospects for 1947 that are not funny but are definitely brighter than they have been.

R. Deane Hearne has taken over the post of district sales manager for the State of Wisconsin for the L. J. Mueller Furnace Company of Milwaukee. He joins the Mueller organization with a background of more than ten years of experience in heating and air conditioning, having sold and engineered residential and industrial installations for all types of fuels.

R. D. Hearne

Mueller has also appointed the Maxwell Brothers Supply Company, of New Orleans, exclusive distributors for Louisiana, southern Mississippi, Alabama and southern Arkansas.

Emil R. Wagner has become manager of Parker's Distributors, Inc., 27 N. Charter St., Madison, Wisconsin, who are wholesalers of heating and sheet metal supplies.

Mr. Wagner had been with the Wisco Hardware Company and had also been a representative for Wheeling Corrugating Company, covering the Wisconsin territory.

John Zink's
—NEW—
UNIT HEATER

●

This new and unique design in suspended space heaters features: *More Head Room—Compact Design —More heat from gas burned,* gas company test shows overall efficiency of 82%.

●

Where floor space is at a premium this turbine type unit has greater heating capacity. Controls are built-in. Unit is shipped completely assembled ready for installation.

●

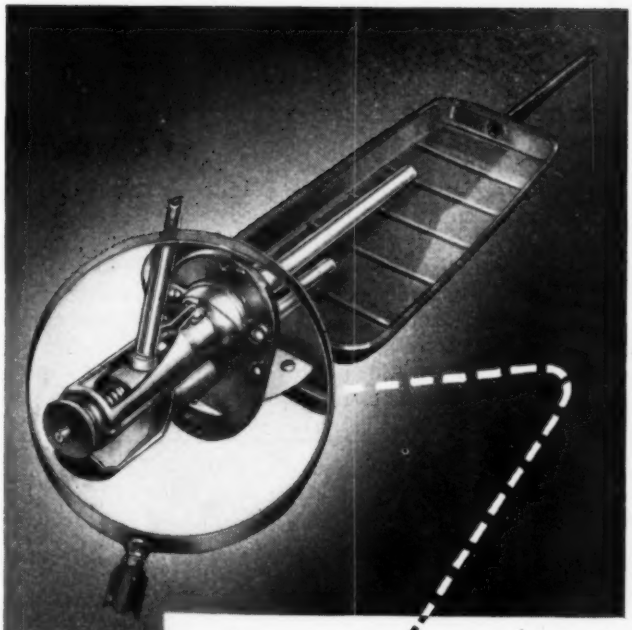
One unit will heat a 40' x 80' space. It is A. G. A. approved for liquefied petroleum gases, manufactured or natural gas.

— WRITE FOR LITERATURE —

John Zink Company

4401 South Peoria
TULSA, OKLAHOMA

New York - Salt Lake City - Houston - Los Angeles



THERE IS A THERMO-DRIP HUMIDIFIER FOR EVERY TYPE OF WARM AIR FURNACE

The Secret of THERMO-DRIP Efficiency . . .

THERMO-DRIP HUMIDIFIERS moisten air as it is heated — *in direct proportion to temperature* — by accurate thermostatic control. That is the simple secret back of the wide acceptance and success of **THERMO-DRIP.**

THERMO-DRIP'S superiority of performance is the direct result of the exclusive **THERMO-DRIP** principle of water feed control as called for by the specific temperature within the furnace itself.

Thus positive evaporation is assured with resultant heat plus comfort for furnace users.

THERMO-DRIP HUMIDIFIERS are manufactured of the finest materials and are engineered for easy installation. Available in a variety of pan sizes for every type and make of warm air furnace.

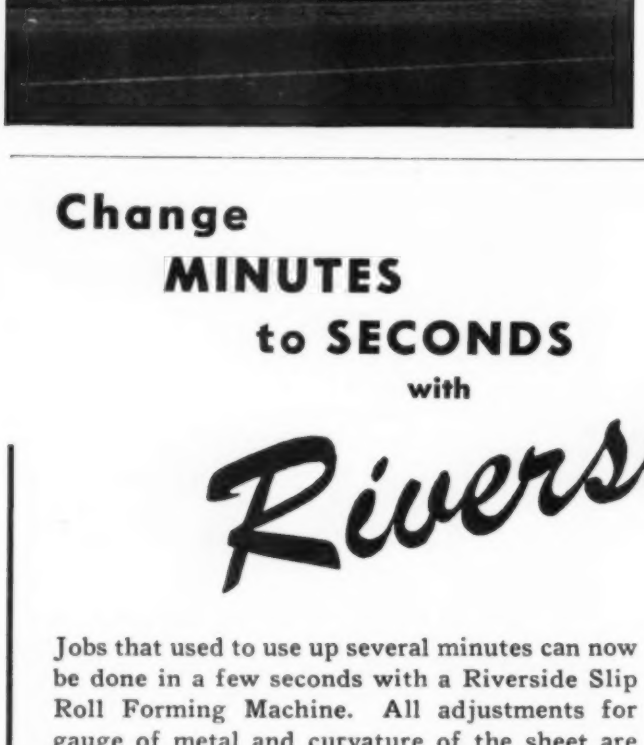
Write today for all the facts on **THERMO-DRIP** Humidifiers.

Made by
Automatic HUMIDIFIER CO.
CEDAR FALLS
IOWA

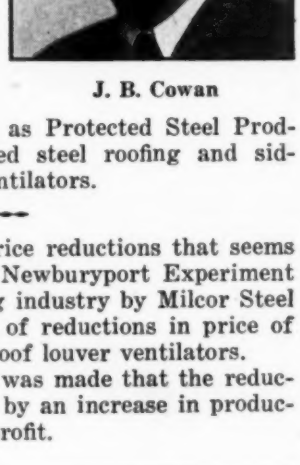
With the Manufacturers

The photo which accompanies this item shows the new shop of Beaman-Sanders, Inc., heating engineers and contractors of Noblesville, Indiana. The firm has only been in existence since May 1st, 1946, but has already established itself with a good volume of trade.

A show room 20 ft. by 40 ft. is a feature of the plant and the actual area devoted to work space is 40 ft. by 50 ft. Normally employing from four to six men the shop is well laid out to accommodate the type of work that it is called upon to handle. Word from H. A. Beaman, president of the company, is that they have been doing rather well in the matter of securing materials and have few complaints about the situation, at present.



J. Benjamin Cowan has been appointed plant manager of Plasteel Products Company of Washington, Pennsylvania. This is the latest in a series of promotions for Mr. Cowan that has seen him go from personnel manager in 1945, when he joined Plasteel, to production manager and now to his present position. Before coming to Plasteel Mr. Cowan had been associated with the Aluminum Company of America.



J. B. Cowan

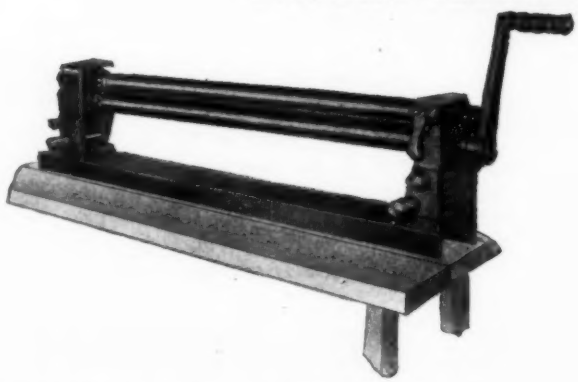
Plasteel, formerly known as Protected Steel Products, manufactures protected steel roofing and siding as well as industrial ventilators.

The present "boom" in price reductions that seems to have stemmed from the Newburyport Experiment was preceded in the building industry by Milcor Steel in its March announcement of reductions in price of side louver ventilators and roof louver ventilators.

At that time a statement was made that the reduction was only made possible by an increase in productive efficiency and a cut in profit.

Change
MINUTES
to SECONDS
with
Riverside
SLIP ROLL
FORMING MACHINE

Jobs that used to use up several minutes can now be done in a few seconds with a Riverside Slip Roll Forming Machine. All adjustments for gauge of metal and curvature of the sheet are made from the front. There is no need to reach around in back to adjust rolls. Another feature of this machine is the new radial adjustment which minimizes flattened area of rolled sheets regardless of curvature. Furnished in both 37" and 31" roll lengths.



RIVERSIDE MACHINERY COMPANY
Shakopee Minnesota

IT'S BACK!

QUAKER'S LOW-COST CONVERSION OIL BURNER FOR SMALL HOMES

FRANCHISES AVAILABLE

Franchises now being offered to well established, reputable dealers. Mail coupon for complete information and literature.

Here's the sure-fire profit-maker you've been waiting for. QUAKER'S famous CONVERSION OIL BURNER is once again available . . . *for immediate delivery!* That means you can install QUAKERS *now* during the slow summer months. Then, when fall comes around, you'll have more time for last-minute installations. Yes, many of your customers will prefer to convert their old-fashioned furnace or boiler into a clean, modern, work-free oil heating system NOW . . . when you can serve them best.

Get the facts about the fast-selling, easily installed QUAKER burner that's *designed* and *priced* especially for the big "small home" market. It's your opportunity for *quick, sure* sales . . . *satisfied* customers. Remember, the famous QUAKER CONVERSION OIL BURNER is back . . . *and you can sell it NOW!*

- **QUAKERTROL EQUIPPED.** Only QUAKER makes QUAKERTROL . . . the ingenious device that automatically regulates the flow of oil and air to the burner.
- **NATIONALLY ADVERTISED.** The QUAKER name . . . the advantages of QUAKERTROL are nationally advertised . . . that means easy selling!
- **FACTORY ASSEMBLED.** No refractories or combustion chamber to build.
- **EASILY INSTALLED.** No installation headaches. Well illustrated installation manual shows how to install the QUAKER in a few hours.
- **PRICED TO FIT THE MARKET.** Priced for the pocketbook of the small home owner.
- **QUIET AS A WHISPER.** No combustion noise.

QUAKER *Conversion* **OIL BURNER**

EXCLUSIVE U. S. SALES AGENT

COMFORT EQUIPMENT CORPORATION

910 South Michigan Avenue • Chicago, Illinois

Manufactured by QUAKER MANUFACTURING COMPANY

223 W. Erie St., Chicago 10, Ill.

COMFORT EQUIPMENT CORPORATION

910 S. Michigan Avenue, Chicago 5, Illinois

Gentlemen

Please send literature and franchise information

Name.....

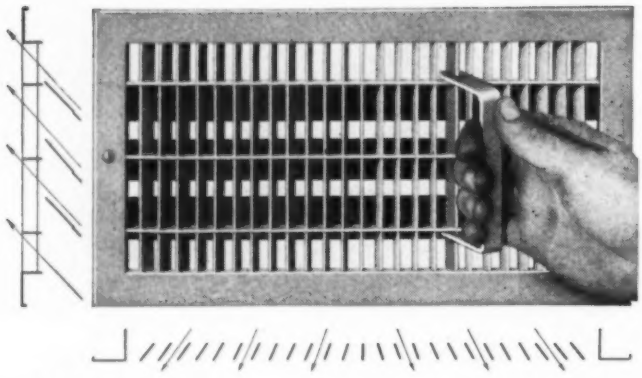
Address.....

City.....State.....

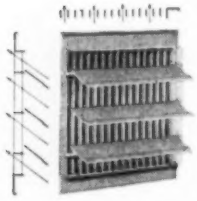
2-47—A5

INDEPENDENT

"Fabrikated" WALL GRILLES WITH DEFLECTING VANES



Style 321-A grille with deflecting vanes



Rear view showing adjustable deflecting vanes

ACCURATE and positive compound deflection of air flows can be readily secured with these "Fabrikated" grilles. Directional adjustments may be made when grilles are installed; or grille bars and vanes may be adjusted after installation to meet unforeseen or changed requirements.

Each grille bar and each deflecting vane is adjusted *individually* with a special two-pronged tool included with each shipment. Locking of grille bars and vanes is not required because they are held firmly in place — no vibration — no rattle. Write for complete details.

MEMBER NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION INDOOR COMFORT

Always Leading—Always Progressing

THE INDEPENDENT REGISTER CO.

3747 E. 93rd STREET · CLEVELAND, OHIO

With the Manufacturers

Char-Gale Mfg. Co., Minneapolis, Minn., as a result of its production of millions of pounds of aluminum pipe, fittings and duct sections with universal acceptance by heating contractors reports that 2S-¾ Hard aluminum in the .025 gauge has been selected as best suited to heating installations and that this type of aluminum will be the standard material used by the company.

From its sales records the company has determined that aluminum in lighter gauges than .025, although appearing stable enough, may constitute a loss in handling during fabrication, transportation, stocking and erection and is not as durable as is necessary for the wide range in sizes of fittings employed in heating work.

Before standardizing on 2S-¾ Hard .025 aluminum the company manufactured and tested aluminum in many other gauges, tempers and alloys, but only the one type seemed to possess all the qualities of durability, ease in forming, suitability in erection required in heating work.

The company is also recommending 2S-¾ Hard .025 aluminum for joist lining because this material can readily be formed in all common shop machines and provides a return system approved by installers. By using one type of material, says the company, the installer can restrict his inventory to one gauge.

Recently Gerald Earle Otis brought an end to a long and distinguished career in heating and ventilating when he retired from his post as vice president of the Herman Nelson Corporation of Moline, Ill. Widely noted for his work in the heating and ventilating of schools he will continue as a director of the Corporation.

Mr. Earle had been with Herman Nelson since 1918 and holds many patents and played an important part in the development of unit ventilators.

Duo-Therm Division, Motor Wheel Corporation, Lansing, Michigan has recently acquired a number of new distributors for their various products.

Handling Duo-Therm furnaces will be: Charles Ilfeld Company, Alberquerque, New Mexico; Commonwealth Sales Corporation, Richmond, Virginia; Boyle Fuel Company, Spokane, Washington; Colcock Furnace Company, Seattle, Wash.; Shelby-Skipwith, Inc., Memphis, Tenn.; Colorado Springs Supply Company, Colorado Springs.

Distributing space and water heaters will be: The Southwestern Company, Inc., Dallas, Texas and the West Texas Appliance Company, Fort Worth.

Irving Abrams is now president and general manager of the Dunbar Sheet Metal Corporation of Dunbar, West Virginia, a firm which does jobbing and contract work as well as manufacturing. Mr. Abrams would like to bring his files of catalogues of equipment, machinery and tools up to date and would be glad to receive copies from any manufacturers.

Manufacturers seeking a representative in West Virginia for warm air heating equipment could also contact Abrams.

DEALERS—here's a FLOOR FURNACE you can sell and forget

The original oil burning floor furnace, Kresky is the only one with forced air circulation bearing the Underwriters' label. Four sizes . . . easily installed . . . takes as little as 30" clearance. ★ Altho unprecedented demands necessarily limit current shipments to old customers, Kresky invites negotiations from live dealers for territories still open.

Listed by Underwriters' Laboratories, Inc. To Burn No. 3 Oil (Diesel) or lighter

KRESKY MANUFACTURING COMPANY
Pioneers in Oil Burning Equipment Since 1910
PETALUMA, CALIFORNIA

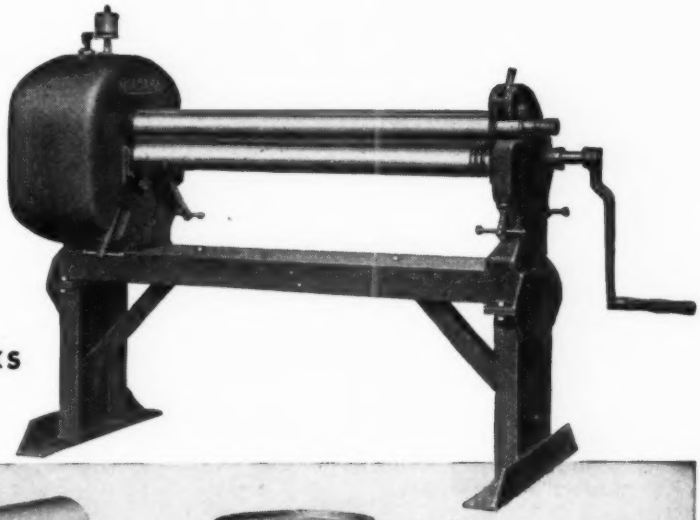
Kresky Oil BURNERS

HEATING • COOKING • HOT WATER • INDUSTRIAL

• Sheet metal men make a great many things, including money, with Niagara Slip Roll Forming Machines.

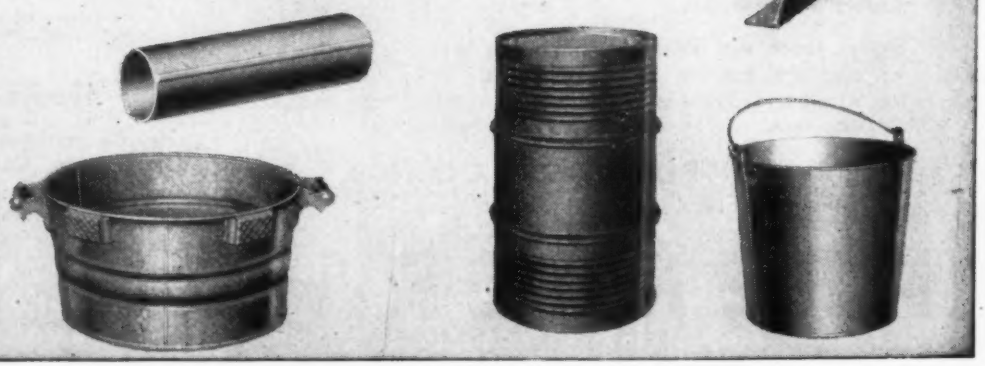
Niagara design makes them easy to operate because the end of upper roll swings forward so that formed cylinders can be withdrawn without distortion. Upper roll opens horizontally, eliminating lifting of roll or work. Trigger release speeds up unlocking, opening and closing upper roll.

Made in various sizes and capacities,—hand and power operated.



NIAGARA MACHINE AND TOOL WORKS
BUFFALO 11, N. Y.
District Offices: **New York, Cleveland, Detroit**

Typical Examples of the Work Done on NIAGARA SLIP ROLL FORMERS



G series cast iron furnace. All parts assembled before shipping. Extra-large one-piece radiator. Ten year guarantee, grates included

Yes-
PREMIER
Is Accepting
Orders for
These Popular
Gravity
Furnaces

SL series steel furnace. Leak-proof riveted and welded. Fire brick lined.

That's right—you can order these high quality PREMIER Furnaces now—and GET them! We are giving pretty good service on these two furnaces now, and are pushing our production hard to maintain at least a moderate stock of each model, for quick shipment.

Because of future uncertainties in securing materials, we cannot guarantee that we'll be able to supply all the PREMIER furnaces that the trade is going to demand. We are determined, however, to do all we can to fill our dealers' requirements.

Get in touch with PREMIER regarding these popular, coal burning gravity furnaces. We will be glad to quote you and tell you exactly what delivery you can expect on your order.

PREMIER FURNACE CO.
DOWAGIAC, MICHIGAN

PREMIER
THE YEAR 'ROUND LINE

News Briefs . . .

New Shop Wishes Catalogs

THE Castner-Knott Dry Goods Company, announces that their new sheet metal shop at Clarksville, Tennessee, superintendent of fabrication and erection, mechanics and service men, are ready to go. The company is now organizing and training a high-class sales force and will cover middle Tennessee and middle Kentucky with a complete line of high-grade warm air heating, ventilating and year-around air conditioning equipment. They invite manufacturers to send catalogs, prices and engineering data.—C. R. Lander, Chief Engineer.

B. L. SCHWARTZ professional engineer of the Schwartz Furnace Company is again in active business at 815 Norwich Avenue, Pittsburgh 20. The Schwartz company resumed heating and winter air conditioning sales and installations shortly after V-E day, in 1945, restricting activities to old home replacements almost exclusively and with gas equipment only.

Gas companies serving the Pittsburgh district now require permits from them before gas service can be made available for heating equipment to be installed after March 1, 1947. Faced with a serious gas shortage, due to inadequate transmission facilities into the district, it looks as though the gas installation business is due to simmer down to a mere trickle for a year or two anyway.

Of interest to the sheet metal contractor is an announcement by Gray's Full Size Blue Print Patterns of Box 520, New Haven, Conn., that they now have available full size patterns for collectors. These are in 9 sizes for intakes from 6″ to 20″.

With patterns for elbows and angles as well as 30 or 45 degree branches this company can supply patterns for nearly all blowpipe work.

Obituaries

Harry C. Knisely

Harry C. Knisely, 78, long prominent in Chicago's sheet metal contracting industry, died March 23, following a long illness. Mr. Knisely had been president of the Sheet Metal Contractors Association of Chicago from 1915 to 1920 and had retired from business in 1936.

Mr. Knisely was a charter member of the Builders Club and served as its president in 1913. He is survived by two daughters, Mrs. Thomas E. Abbott of Hinsdale and Mrs. George Dreher of Michigan City.

Robert Whitely

Robert H. Whitely, president, Randall Graphite Products Corporation, Chicago, Ill., died of a heart attack, age 57, April 25, 1947. Mr. Whitely was one of the first members of the Randall firm, having become associated with it thirty-eight years ago. Burial was at Big Foot Prairie, Wis., his birthplace. He is survived by three sons in the business, Robert L., Howard C., and Kenneth E., and by his widow and a sister.

No other AIR COOLER Only Marsalis

GIVES YOU THESE
EXCLUSIVE SALES FEATURES!

POSITIVE REDUCTION ROOM TEMPERATURE 24 HOURS A DAY

CONTROLLED AIR DIFFUSION

Non-rotating louvers of unit give fingertip control, to direct diffused circulation where and when desired. A Marsalis "exclusive" that insures extra home-cooling profits!

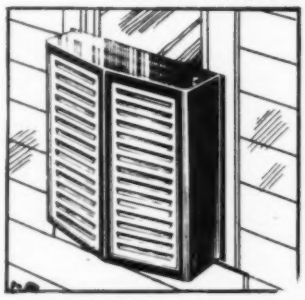
ADVANCED ENGINEERING

Easy to install — will not mar windows or buildings. Advanced Marsalis engineering means customer satisfaction .... more sales ... protected profits.

DECORATOR STYLING

The Marsalis Cooler is finished in two beautiful shades of brown, with plastic front and side panels. Proof than an efficient home-cooling unit can be attractive, too!

STREAMLINED EXTERIOR!



CONTROLLED HUMIDITY

Exclusive cooling pad design assures controlled humidity—re-circulating pump eliminates messy drains. Another *must* in any good air cooler. Check these exclusive advantages! Let Marsalis make sales for you!

Unbelievably low first cost! Operating Expense Little More Than Electric Fan!

Marsalis Cools

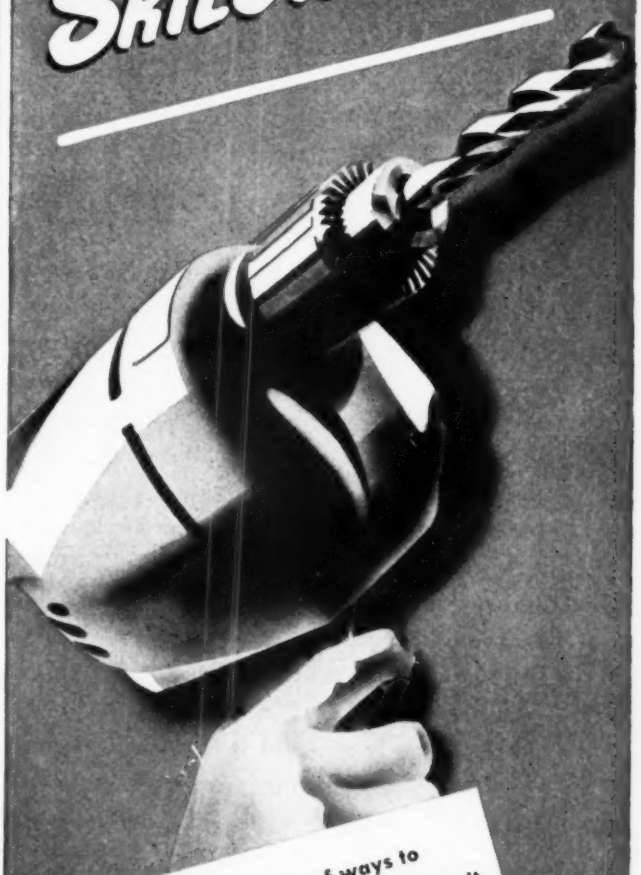
WRITE TODAY

31st year IN THE DESIGN, MANUFACTURE AND INSTALLATION OF AIR-TREATING AND AIR-HANDLING EQUIPMENT.

AMERICAN METAL PRODUCTS COMPANY
P. O. BOX 7037 SYLVANIA STATION FT. WORTH, TEX.

DON'T JUST DRILL IT...

SKILDRILL IT!



There are all kinds of ways to drill a hole ... but only one way to do it better, faster, easier ... that's with a SKILDRILL. Ask your Distributor today about a demonstration.

SKILSAW, INC.
5033 Elston Ave., Chicago 30, Illinois
Factory Branches in Principal Cities

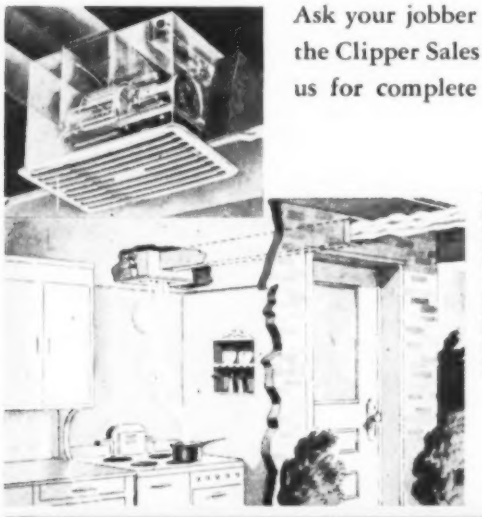
ELECTRIC PNEUMATIC
SKILTOOLS

MADE BY SKILSAW, INC.

AS a result of Clipper Blower consumer advertising more than 20,000 housewives asked about the Clipper last year. This can mean real business for you.

These patented small room ventilators are specially designed for kitchens, bathrooms, dens . . . as well as for ticket booths, X-ray rooms, toilets, clinics—in fact any small room. They are mounted in the ceiling between joists and vented outside—they trap and expel unwanted air, heat and odors the instant they rise.

Unlike any other equipment, the Clipper Blower is a complete packaged ventilator in which the motor is entirely removed from the air stream—away from all contaminated air. This means greater efficiency, longer life and easier servicing.



Ask your jobber for details of the Clipper Sales Plan or write us for complete information.

The Clipper is a complete packaged ventilator which is hidden in the ceiling. Only an inconspicuous "dripless" ceiling grille is visible, yet motor and blower assembly are instantly removed without tools for service.

TRADE-WIND MOTORFANS, INC.
5703 SOUTH MAIN ST., LOS ANGELES 37, CALIF.

News Summary

(Continued from Page 64)

Management May Now Speak

RECENT rulings of the National Labor Relations Board continue to indicate that the National Board has had a decided change in viewpoint, and the trend of its decisions indicate that the Board intends to follow its recent ruling permitting management the right to express anti-union views to employees if (1) management statements are not coercive or threatening; (2) management conduct does not otherwise display an anti-union pattern; (3) isolated statements issued by managers, foreman, etc., will no longer be considered as complete reflections of management's attitude on labor. This last ruling is especially important because in previous cases NLRB has accepted an isolated statement by a foreman as an indication of management attitude and has ruled on the case accordingly.

Are Prices Too High?

THE business structure division of the Department of Commerce has recently made a study to determine what prices are too high and what prices are in line with general business conditions. In brief, the Department of Commerce study showed four general groups of products and materials which the department arranged by price relationship as follows:

Products whose prices are at least ten per cent above the general price level are paint and paint materials, lumber, leather and cotton goods, oils and fats, etc.

Products and materials whose prices are generally in line with the current price level are: plumbing and heating goods, coal, cement, iron and steel, motor vehicles, and a long list of so-called soft goods such as materials, grains, dairy products, chemicals, hides, clothing, etc.

Products and materials with a price level at least ten per cent below the general price level are: Non-ferrous metals; anthracite coal, petroleum and petroleum products, and a few miscellaneous items.

Surplus Property Disposal

WAR surplus disposal sales are still proceeding at a rate of approximately fifteen million dollars a year, but the peak is past and prices on goods, plants, etc., are beginning to fall off. For the $16,000,000,000 of stuff sold so far, the government has received about $6,000,000,000. Washington reports that in general most of the larger war plants and war production facilities have been sold and remaining surpluses are in items which were necessary for war but do not find immediate application in civilian activity. Washington agencies hope to wind up surplus property disposal by June, 1948.

THE OLD RELIABLE . . .

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SINCE 1785

#137

FOOT SHEAR

WILL SOON AGAIN BE

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The famous PEXTO Foot Shear . . . the Foot Shear that never was equalled . . . "went to war" and now is back — IMPROVED.

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SOUTHINGTON, CONNECTICUT U. S. A.

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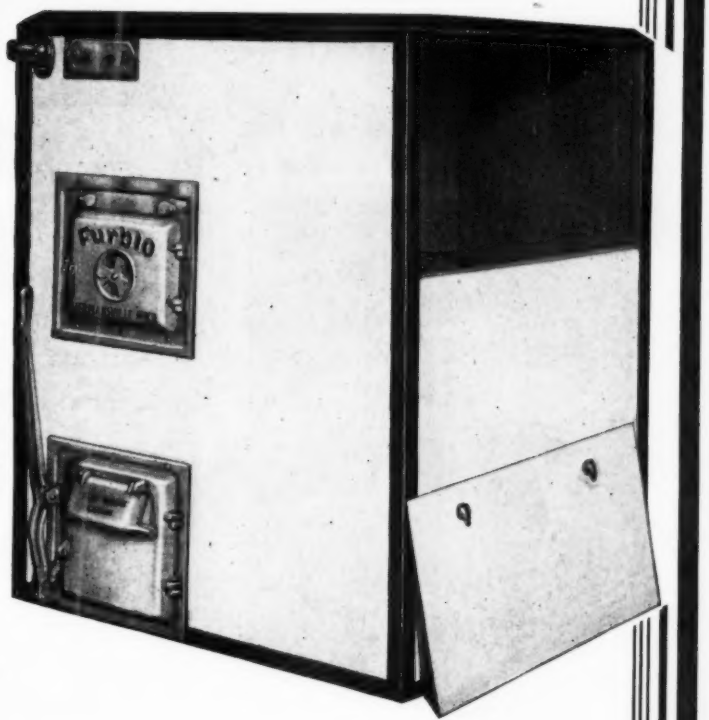
WINTER

AIR CONDITIONER



The new Furblo winter air conditioning unit is the latest addition to the time-tested, reliable Furblo line. It enables you to give your customers the ultimate in heating comfort and efficiency while at the same time affording yourself a nice profit on each installation.

The large special shaped radiator and ample heating surface assure a maximum of heat transfer to the heat compartment from where it's forced to the living quarters by the correctly sized blower. This quick and efficient transfer of heat assures economical fuel consumption and top heating plant efficiency. The new Furblo is a modern, dependable, winter air conditioning unit which will enable you to expand your services to your customers and result in bigger and better business for you.

More information and literature are available. Please write us today.

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TRIANGLE SHOCK ABSORBING PILLOW BLOCK

Designed by Triangle engineers for fans, blowers and other devices requiring silent operation, perfect alignment and self-lubrication.

Preloaded oil-proof cushion built into the bearing.
Ball-and-socket design.
Write for samples and complete information.

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Individually Controlled Airtherm Propeller Fan Unit Heaters Will Cut Your Fuel Bill

AIRTHERM Propeller Fan Unit Heaters will reduce your fuel costs.

Heat can be uniformly distributed through the use of AIRTHERM Heaters with individual controls, eliminating dead spots in your plant and increasing your heating efficiency.

There is an AIRTHERM Heater for every heating application. Write for Bulletin 1206 giving complete range of available sizes.

AIRTHERM
MANUFACTURING COMPANY

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SMCNA Convention

(*Continued from Page 93*)

sociation were keynoted by Patrick S. Varden in his president's address as—the extention and protection of all work to which we are entitled; the increasing of the percentage of profits which our contractors should enjoy; the problem of prices getting too high because of increased material and labor costs; and the need for national co-operation in order that our industry may expand its activities and increase the profits from our efforts.

President Varden pointed out that there seems to have grown up a feeling that since our craft is as skilled as are others in the building trades, our mechanics are entitled to as high a wage rate as any other mechanic, but the truth of the matter is, our industry may not be able to pay as high a wage rate as are other crafts, in proof of which is the fact that surveys show in 1940 approximately 48 per cent of an average sheet metal contract was represented by material and 52 per cent by labor, whereas in 1946, the percentages changed to approximately 42 per cent for material and 58 per cent for labor. On this basis, he explained, we can not obtain as much profit as do trades such as the electrical industry where in 1946 54 per cent of an electrical contract represented material and 46 per cent labor. On our present basis, he said, we must depend for most of our profit from the selling of labor.

For a long time, said President Varden, our industry has clamored for relief from government control; now that we have it, we must provide our own protection; we can do so only through the close co-operation of local, state and national associations.

America, today, said Mr. Varden, seems to be faced with a lack of understanding between one group and another; collective bargaining, desirable as it is, can not be carried forward unless everyone in the industry has full knowledge of all the problems involved and a complete willingness to co-operate through local, state and national associations.

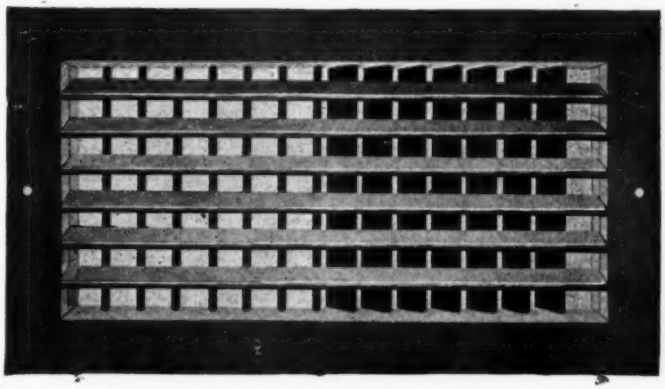
The National association has accomplished much in the past year, and has well laid plans for still greater accomplishments in the coming year. Policies by themselves, he said, can not improve the standing of an industry and can not even be made to work unless all members of the industry co-operate. Right now the industry must work hard to protect and extend its jurisdiction; the industry must have large plans to maintain its dignity; and much clarification is needed in order that all parties with whom our industry comes in contact shall understand our problems and our jurisdiction. This can be obtained only by sound business practices, sound labor relations policies, and a workable national program.

Address of Robert Byron

Robert J. Byron, general president, Sheet Metal Workers International Association, declared that there never was a time when there was greater need for a strong national employers' association, because other crafts are trying to take work away from our indus-

YOU CAN GET IT QUICKER FROM

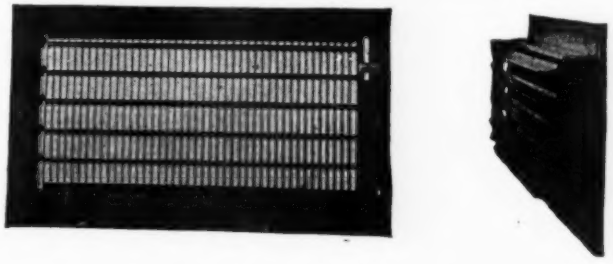
STEWART



HIGH VELOCITY OUTLETS

Style DDH is one of 8 variations of Stewart High Velocity Outlets that can be supplied with or without volume valves. Each bar is adjustable with a key (furnished). This unit is a heavy attractive Outlet made in all popular sizes, with matching fixed-bar down-deflecting return grille. *HIGH VELOCITY OUTLETS CAN BE SUPPLIED TO FIT CONTOURS OF CABINETS FOR ROOM COOLERS.*

MULTIPLE DAMPER OUTLETS



For Wall or Baseboard

Style 74—Register. This Register utilizes 1" multiple-dampers to control volume and vertical direction. Multiple dampers may be set so as to obtain up, straight, or down deflection, as well as complete shut-off. The face is the same as all others of the "70" line—permitting air deflection right or left by adjusting front blades with key furnished. Blades are ¼" center to center, and ¼" in depth.

THE COMPLETE STEWART LINE

The Stewart line is competitively priced and consists of a wide variety of popular types and sizes (not shown) of High Velocity Outlets, Wall and Baseboard Registers, Diffusing Grilles and Radiator Fronts that meet most air-conditioning and heating needs. Construction is substantial and of cold rolled steel protected with a priming coat. Special types and sizes can be made to your specifications.

PROMPT DELIVERIES ON STANDARD MODELS.

For immediate quotation and literature—Ask for Bulletin.

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Kling
ROTARY SHEARS
DO MANY TYPES OF WORK
DOES ALL THIS WORK FOR YOU
1 CUTS STRAIGHT LINES
2 CUTS RINGS-SMALL OR LARGE RADII
3 CUTS CIRCLES
4 MAKES FLANGES
5 CUTS INSIDE HOLES WITHOUT CUTTING IN FROM EDGES
6 JOGGLES & OFFSETS
7 CUTS ODD SHAPES
8 BEVELS OF ANY ANGLE
9 CUTS REVERSE CURVES
10 BEADS & U's
ALL WITH Hairline PRECISION

Yes, and With Hairline Precision

Rapid operation . . . Hairline Accuracy . . . the use of Kling Rotary Shears marks the latest development in cutting mild steel, and sheet metal, up to 1-inch with amazing savings in time, labor, and production costs.

For exacting projects (see illustration at the right), no single unit of metal-working equipment does so many different things so clearly and efficiently as does the Kling Rotary, pictured above.

In metal working plants, automotive, aviation, home appliance, and other industries, where work of this character is being done, — this machine is held in high regard for its versatility and economy of operation.

This great usefulness is the result of half-a-hundred years of engineering experience which prospective buyers, with reason and repect, applaud.

Send Today for Bulletin No. 245 which will give you specific facts, and specifications. No obligation involved. Users of heavy equipment of Kling Rotary Shears' class will receive a copy of this Bulletin promptly, on request.

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try every day; even owners and general contractors are attempting to do sheet metal work directly. There must be even closer co-operation between employers and labor if the jurisdiction we now enjoy in sheet metal work of ten gauge or lighter are to be maintained and extended.

Mr. Byron urged contractors to make every possible effort to obtain all sheet metal work to which we are entitled and to have rightful work included in the sheet metal specifications. Such an effort, he said, will do much to stop jurisdictional disputes, and should eliminate the complaint that locals are furnishing men to other contractors to apply work of our jurisdiction. The real reason for this, said Mr. Byron, is that the sheet metal contractor has failed to claim the work and labor must do the work in order to protect its jurisdiction. Work items specifically requiring this cooperative effort are steel roof decking, corrugated roofing and siding, stainless steel work of all types, aluminum store fronts; all heating and air conditioning installations, including the heating and cooling units and fans; blow pipe work; ovens of all types; spray booths; etc. Wherever possible, urged Mr. Byron, sheet metal contractors should claim the installation of such work and should purchase the equipment themselves. It is a basic policy of his association, declared Mr. Byron, to furnish men only to recognized sheet metal contractors; locals will do this if the contractors will co-operate by claiming all work we are entitled to.

In answer to the National association's request that consideration be given to a "B" grade mechanic, Mr. Byron said the union has never given thought to any rates other than one scale for mechanics and one scale for apprentices, and he feels there are much more serious problems to be cleared up before the "B" grade mechanic problem is reached.

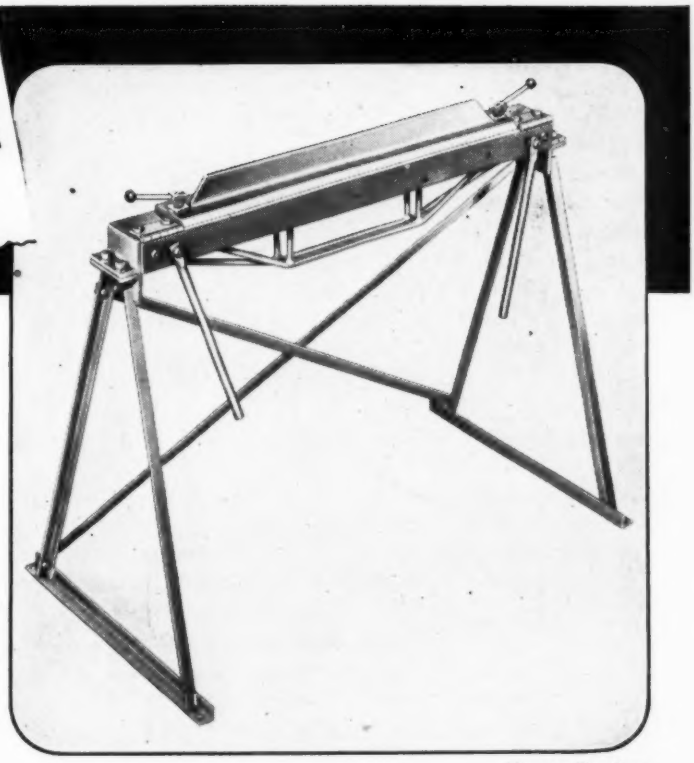
Mr. Byron asked contractors to consider the possibilities in fireproofing wherein fire doors, metal doors and windows, calamine doors, all appear to have large sales possibilities as a result of recent disastrous fires which have focused attention upon the need for adequate fire protection in structures. Finally, Mr. Byron said it appeared there is a great future in warm air heating and air conditioning if the work is properly designed and properly installed and wherever possible is properly regulated through adequate and up-to-date city building codes. He suggested that the modernization of building codes is one field in which the National association can find a great deal of work to do.

The Copper Situation

William A. Amelung, manager of sales development, Chase Brass & Copper Company, explaining the future possibilities of copper supply pointed out that many jobs today are specifying costly materials like copper in an endeavor to protect the high cost now involved in any building construction. The problem of future copper availability is divided into two phases (1) supply of basic ore and (2) production of copper in the forms used by our industry.

At the moment, said the speaker, the supply of copper ore is wholly inadequate. There was a sufficient supply in the war period, because the Metals Reserves Corporation bought foreign ore at world prices and

At Last! an ACCURATE, PORTABLE Sheet Metal Brake



WEBCO Portable Brakes in capacities up to 49" give you quick, accurate bends on the job . . . operate on a production basis in your shop!

HERE is the brake that sheet metal men have been looking for! The *Webco* is portable, and so compact that it fits easily into the back of a car or pick-up truck . . . it's accurate and serviceable, makes sharp, clean bends up to 150°, including "Pittsburgh" bends and 1¾" pan boxes, without special adjustments . . . and, the price is so low that it is possible for it to pay for itself on a single job! Exclusive *Webco* features such as finger-tip control of folding bar assure quick, easy operation—in the field or in the shop.

Ask your dealer today about the new WEBCO Portable Brakes, or write direct. Full information furnished without any obligation.

Manufacturers of WEBCO Cold Forming Machinery

Patents Pending

WEBB MACHINE & TOOL CO.
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At Last A Perfectly Designed "Packaged" Coal

FURNACE FOR LOW COST HOMES
THE KEHM FREE-AIRE HEATER

The new Kehm Free-Aire Heater fills a long felt need for a miniature furnace perfectly designed for small basement and no-basement homes—90% of your new construction market today. Can be used in a wide variety of approved "Free Aire" duct designs to save labor, materials and money. Can also be used for small gravity full duct installations, furnace replacements and many types of pipeless furnace applications and short duct extensions.

18" propeller type fan—any speed up to 600 C.F.M.—holds large supply of coal—18" brick refractory firepot—tubular cast iron construction—1/40 H.P. MOTOR—removable ash pan—supply and return openings—85,000 B.T.U. output—70% efficiency. Low fuel cost.

Dealers and furnace jobbers. Write at once for complete information and low price.

THE KEHM CORPORATION

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Over 50 Years in Heating

Beautiful Brown Baked Enamel Finish—Size 24 x 24 x 50

sold it in the domestic market at the domestic price, no matter what the world price paid might be. America is not now buying in the foreign market because the four cents per pound duty now imposed on imported copper is stopping all purchases.

In explanation of supply, Mr. Amelung pointed out that today there is an anticipated average monthly demand of 139,000 tons against a total average monthly production of 53,000 tons, so the demand is at least 200 per cent greater than the supply. The most optimistic figures indicate that a balance may be reached late in 1948 or 1949. At that time, he said, the present 21 cents per pound domestic price likely will be increased to 23 or 24 cents.

More important than supply, explained the speaker, is rolling mill capacity which in 1947 is far under demand. This is due to the fact that increased production facilities during war time were largely for the production of narrow or strip copper and brass and such narrow widths are not suited to the construction industry; therefore there is no increased capacity to take care of the increased demand. The speaker suggested that to offset this in some measure, contractors should order and make use of copper just as narrow as possible and should give their suppliers every opportunity to furnish alternate widths wherever possible.

The Steel Situation

Edward L. Ryerson, Chairman of the Board, Inland Steel Company, addressing a luncheon group declared he could answer the question uppermost in everyone's mind—"When Will Steel Be Plentiful" by stating that "steel will be plentiful when contractors don't want it." He pointed out that mill capacity has increased from 82,000,000 ingot tons prewar to 92,000,000 tons in 1946 with the production of sheet and strip reaching 19,000,000 tons by the end of 1947, which represents a gain of approximately 18 per cent above the 16,000,000 ton capacity of sheet and strip in 1939.

Mr. Ryerson declared that delays in obtaining new equipment and high cost may still further delay the present expansion programs, but there may be increased capacity available late in 1947. He emphasized that not only are old users of steel placing heavy demands on the industry, but that numerous new products including building materials are asking for greater and greater amounts of sheet and strip steel. The three million ton increase in sheet and strip production in 1946 over 1929 has been lost in the huge demand which has developed.

Mr. Ryerson did not see much chance for substitute materials such as glass or plastic to seriously compete with steel and he declared that even acceptable aluminum will, for many years, represent only a small fraction of the total production of steel sheet and strip. He pointed out that the picture is further confused by the fact that some sheet mills have been purchased by large consumers; others are turning over their complete production to large users; and many coating mills have been closed down waiting modern equip-

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EXCLUSIVE DOUBLE RADIATOR

GREATER FLUE TRAVEL

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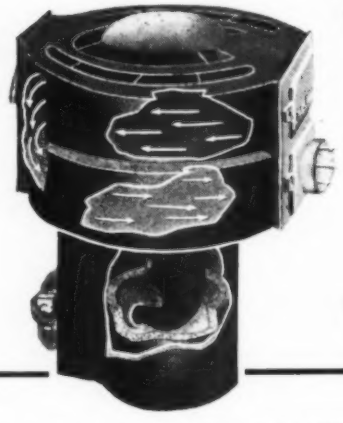

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Make More Ventilator Sales

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Swartwout Ventilators

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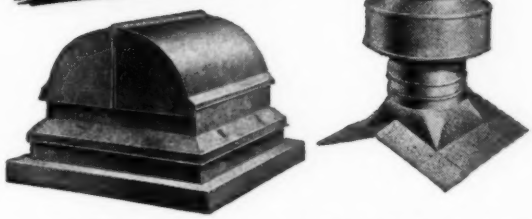
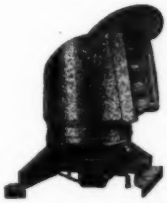
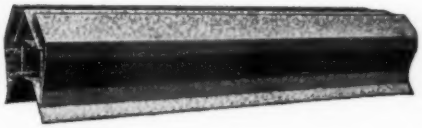




Give industrial and commercial building owners your expert help in solving their ventilating problems. You can promote a lot of profitable business by showing them the possibilities of Swartwout Ventilators. Ject-O-Valve and Airjector for efficient power air movement; Airmover and Dexter Heat Valve for large scale gravity type systems — successfully used on thousands of plants. Other types for various lighter jobs. Ask for our help on engineering problems. Send for Catalog Bulletin 319.



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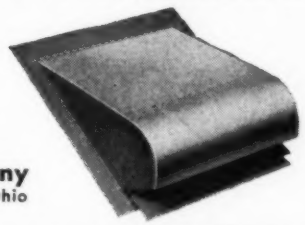
Sell and install your share of these profit-making house louvers and ventilators. Most new housing construction, and all old buildings being insulated must have under-roof space ventilation. Send for Bulletin 317-C.

Swartwout Louvers with self-flashing construction—3 sizes. Also flush type, for old construction—5 sizes. Roof ventilator is a new, pleasing design.



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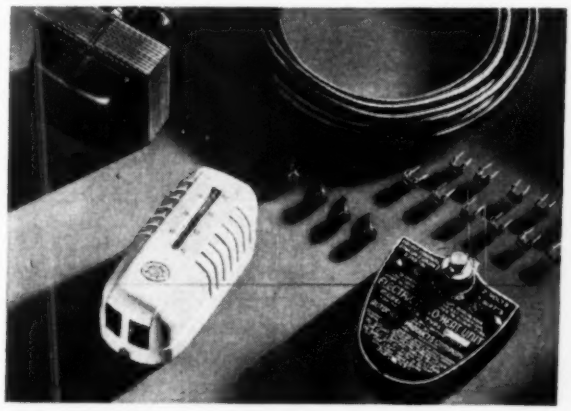
Controlled **Air Circulation**
EQUIPMENT FOR EFFECTIVE ECONOMICAL VENTILATION OF INDUSTRIAL BUILDINGS

MAKE *Extra* SUMMER PROFITS

HELP YOUR OIL HEATER CUSTOMERS TO NEXT WINTER'S FUEL SAVINGS . . . *NOW!*

● You can install THERMOSTATIC Temperature Control on most of the oil heaters you have sold since 1939! That means extra profits on every sale you made during the last 8 years!

Most of your oil heater customers — even those as far back as 1939 — can enjoy the luxury and economy of A-P THERMOSTATIC Temperature Control. And NOW is the time to tell them about it, when their heaters are inactive during the summer months. If their heater uses the A-P Constant Level Oil Control Model 240-DR, UR, or YR you can easily and inexpensively install a new A-P Model 240-ED Heat Regulator Set. They'll thank you next winter, when their fuel bills run 10% to 25% lower, and they're enjoying the pleasure and convenience of steady, uniform heat without the danger and discomfort of overheating — at the mere setting of a *thermostatic dial.*



The A-P DEPENDABLE Model 240-ED Heat Regulator Set. Includes an Electric Conversion Top to mount on present Manual Control, accurate Wall Thermostat, Transformer and all accessories and instructions.

WRITE TODAY for details and prices — and supply of colorful direct mail folders to help you to ready SUMMER PROFITS on A-P Heat Regulator Sets.

Be sure your new heater lines use · · · A-P DEPENDABLE OIL CONTROLS — for faster sales, greater customer satisfaction.

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AP DEPENDABLE *Oil Controls*

DESIGNED TO ELIMINATE SERVICING

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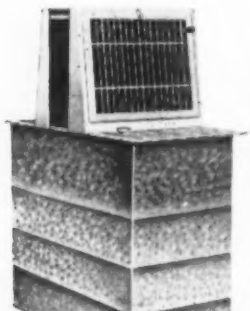
Because there *are* two sides to the Pacific Dual Register Floor Furnace story, homes are heated better. Easily installed in wall, the Dual Register services rooms on either or both sides of wall. With all the engineering features that made the Pacific Floor Furnace nationally recognized, the Dual Register Furnace is helping further Pacific's third-of-a-century reputation for outstanding gas heating engineering.

Features include exclusive multi-tubular burner, famous Pacific heating element with efficiently contoured warm air passages, choice of controls and of sizes. Fully vented —no clammy walls or stuffy rooms.



A long-established, proven money-maker is the entire Pacific lineup of gas heating equipment—now includes Vented Console Heaters, Floor and Dual Register Furnaces, Winter Air Conditioners, Gravity Furnaces, Suspended Units and Duct Furnaces. Investigate the dealer franchise opportunities in your community for this pioneer Western firm of gas heating experts. Write today for full particulars.

Gas Heating Specialists for more than a third-of-a-century

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NACO MANUFACTURING CO.

P. O. Box 310, Huntington Park, California

ment so that coated sheets are even harder to obtain than uncoated sheet and plate.

If a recession comes, Mr. Ryerson said, that may be the time during which mills will catch up on their demand; even so the principal users of sheet, such as the construction industry, seem likely to be least affected by any recession, and therefore increased supplies to the construction industry must come from other industries whose demands are falling off. As to prices, Mr. Ryerson declared that he expected present prices to be maintained so long as mills are operating at full capacity, but if production and demand seriously declines, then prices may have to go up temporarily to cover increased cost of manufacturing and it will require a recession of several months duration before prices will turn downward.

Fabrication of Aluminum

Dr. George Perkins, Director of Technical Research, Reynolds Metals Company, explained some past history of aluminum, and how, in the late 1800s, a man by the name of Hall perfected the electrolytic deposition method which is in use today so that, by 1939, the price of commercial aluminum had dropped to 20 cents per pound and the U. S. capacity was about 325 million pounds. Production today is in the neighborhood of 2½ billion pounds per year, of which 80 per cent is in the form of sheet, coil, and strip. Even this production represents only four to five per cent of the production of steel sheet and strip by weight and only 15 per cent by volume, giving aluminum a three to one weight advantage over steel.

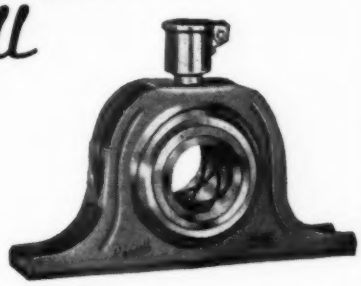
As to the possibility of aluminum price reduction, Mr. Perkins explained that aluminum is practically everywhere in the form of clay, but as yet we have no process which can economically reduce clay to aluminum. At the present most aluminum comes from bauxite mined in Arkansas or South America.

On the advantages of aluminum, Dr. Perkins said he believed that availability of the basic ore is probably the No. 1 advantage. No. 2 is aluminum's light weight. No. 3 is its ease in working both in the machine and by the mechanics. No. 4 advantage is the necessity for fewer men in erection and the elimination of insulation or painting. No. 5 advantage is its greater heating efficiency through less loss of heat through the material.

On the disadvantages of the material, Dr. Perkins cited the present price of aluminum at 23 to 30 cents per pound as compared to galvanized iron at 8 to 9 cents a pound on the legitimate market. Today aluminum in many cases is cheaper than galvanized iron, but this is only a temporary advantage due to the scarcities of black and galvanized sheet. At the present the speaker said, the aluminum industry is not recommending aluminum for use as smoke pipe or chimney liners, or in bonnets of furnaces because aluminum melts at 1200 degrees F. and softens in the ranges of 500 to 600 deg. F. and where exposed to temperatures exceeding 450 deg. tends to change its structural composition.

For all sheet metal work in heating, ventilating, air conditioning and sheet metal work the speaker recommended aluminum of the 2S¾ hard as the most inex-

SMOOTH, ACCURATE
Randall
BEARINGS
for
Quiet



Dependability

Randall Self-Aligning, Self-Lubricating Pillow Blocks give long, dependable, quiet service because bearing surfaces are always smooth and accurately finished. Large double or single oil reservoirs provide continuous operation with minimum attention. That's why so many engineers and contractors specify Randall for every air handling installation.

Millions of these pillow blocks have been put in use. For the *complete* story and valuable installation hints, write for Catalog 47.

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★ ARMSTRONG! ★ MODERNAIRE!
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YOUR COMPLETE HEATING NEEDS CAN BE FILLED BY BUYING AT—

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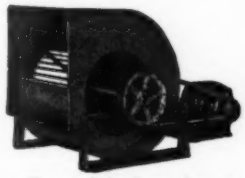
THE REX BLOWER LINE assures superior service to users because it includes enough models to provide an extra-wide choice of air deliveries (from 400 c.f.m. to 32,000 c.f.m.), each at a number of speeds. Meeting air movement requirements accurately keeps both the initial cost and operating cost of a heating system as low as possible. There's no need to seriously over-power an installation to assure adequate comfort at peak of demand—or grossly under-power one to cut original expense. In the Rex Blower family you can readily find a "happy-medium" model that will give maximum all-around satisfaction. Send for complete specifications and performance data charts today.



For original equipment use, send for Catalog No. 222. For conversion of existing gravity jobs to forced warm air systems, send for Catalog No. 238-A.

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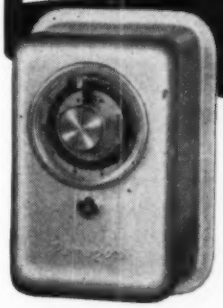
NEW *Attic Fan* Timer
BY
Paragon



★ Two time ranges . . . 0 to 10 hrs., 0 to 20 hrs.

★ Telechron motored . . . quiet; no ticking; self-starting, synchronous.

★ Underwriters' approved for 115 V. A.C., ¾ H.P. . . . accurate and dependable.

This new AF Series Timer will make you extra profits this spring and summer. It works with any A.C. fan—attic or window.

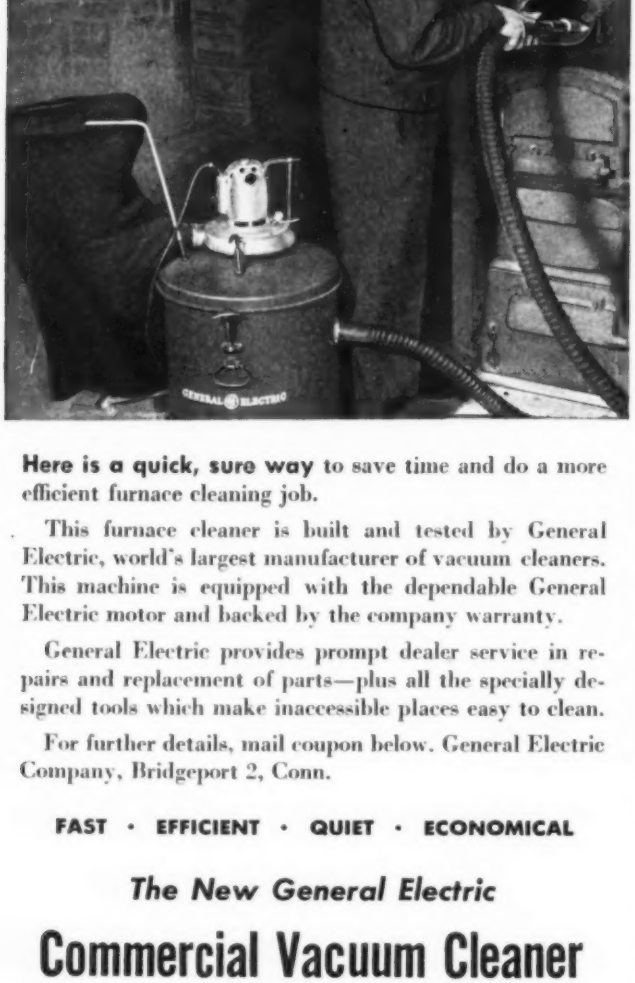
A real comfort and convenience to the user . . . and at only $9.75 list an outstanding value. Write for sales aids, or order from your jobber.

PARAGON ELECTRIC COMPANY
1608 TWELFTH STREET • TWO RIVERS, WISCONSIN

Paragon Two Rivers WISCONSIN
BUILDERS OF ELECTRICAL EQUIPMENT . . . SINCE 1905

Faster—more efficient furnace cleaning!

Check these advantages of the General Electric Furnace and Boiler Cleaner



Here is a quick, sure way to save time and do a more efficient furnace cleaning job.

This furnace cleaner is built and tested by General Electric, world's largest manufacturer of vacuum cleaners. This machine is equipped with the dependable General Electric motor and backed by the company warranty.

General Electric provides prompt dealer service in repairs and replacement of parts—plus all the specially designed tools which make inaccessible places easy to clean.

For further details, mail coupon below. General Electric Company, Bridgeport 2, Conn.

FAST · EFFICIENT · QUIET · ECONOMICAL

The New General Electric

Commercial Vacuum Cleaner

GENERAL ELECTRIC

A & M Department, General Electric Company, Bridgeport 2, Conn.
Sirs: 227-131A

Please send me descriptive literature on the General Electric Furnace and Boiler Cleaner. ( )

Please arrange for a free demonstration. ( )

Name of individual.....

Name of firm.....

Address.....City.....State.....

Address of President-Elect Walsh

At the banquet, President-elect R. E. Walsh asked for the continued support and co-operation of all the members of the association who have been so helpful during the past two years in committee work and declared that with such co-operation the success of the association is assured. The association's present favorable status could not have been reached without the hard work by hundreds of members, said President Walsh, and he called attention to the vast amount of preliminary work which was done by such long time members as the late George Harms; Paul Biersach of the Wisconsin state association; ex-president Patrick S. Varden; Ed. Merrick of Louisville; Rudy Guenther, a director and chairman of the first annual convention in Chicago, Victor King who has done such a splendid job of organizing the North and South Carolinas association; Edward Pluth, past president of the Illinois state association; Ben Kolbenschlag, whose representation from St. Louis is among the highest in the association; and such stalwarts as W. H. C. Ness of Los Angeles; Charles Ruebeck of Waco, Texas; Harvey Orton, chairman of the publicity committee; Joe Walter of Ottawa, Illinois—all of whom, said President Walsh, contributed unstintingly contributed of their time and energy. If the newcomers will follow in the footsteps of these men who made the National association possible, declared President Walsh, there can be no doubt that the National association will grow and become an expanding influence in the sheet metal, warm air heating and roofing industries.

Plaque to President Varden

As a token of esteem and appreciation for the efforts of Past-President Patrick S. Varden during his two years in office; the Board of Directors and Officers of the association presented to Mr. Varden a bronze plaque suitably inscribed and with the hope, as stated by Harvey Orton in making the presentation, that Pat Varden will hang the plaque on his wall so that whenever he looks at it will remind him, with pleasure, of the years he served and the fine friendships he has made and the esteem in which he is held by every member of the association.

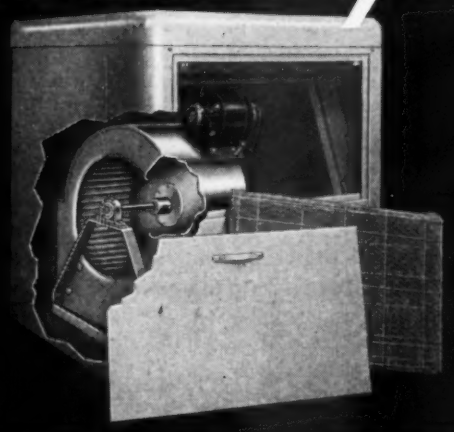
Entertainment

Very encouraging to all the members of the association was the registration of more than 100 ladies pensive, easiest material to work and erect, and possessing sufficient stiffness to be handled in the average sheet metal shop. The speaker recommended painting the aluminum on installations within 50 miles of the seascoast.

Dr. Perkins recommended that where black iron must be used in contact with aluminum that the black iron be painted with a bitumastic paint, but where aluminum is in contact with galvanized iron, no protection is required.

As to the future, Dr. Perkins foresees a possible reduction of one to two cents a pound, using a new alloy sheet which is now being tested and a production which will be more than ample to meet demands in the years to come.

Brundage



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Maintain their Pre-war Quality Construction

And that is why you are sure of superior performance, economy of operation, and few, if any, service worries.

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Since 1919
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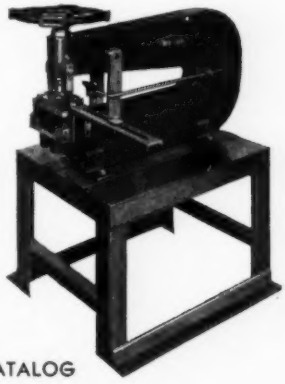
WHITNEY-JENSEN PRODUCTS

30 YEARS EXPERIENCE

NO. 24 & 25 BALL BEARING PUNCHES

Capacities—1/2" thru 3/8" & 3/8" thru 3/8".
Throat depths—3 1/2" & 8".

Punches and Dies available—
1/8" thru 13/16" by 1/64" variation.



NO. 26 & 27 BALL BEARING DEEP THROAT PUNCHES

Capacities—2" thru 3/32" & 1/16".
Throat depths—18" & 24".
Punches and Dies available—1/8" thru 2" by 1/32" variation.

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NO. 40 BALL BEARING PUNCH

Capacities—5/8" thru 5/8".
Throat depth—3 1/2". Weight—66 lbs.
Punches and Dies available—
1/8" thru 1" by 1/32" variation.

WHITNEY METAL TOOL COMPANY

91 FORBES ST. • ROCKFORD, ILL.

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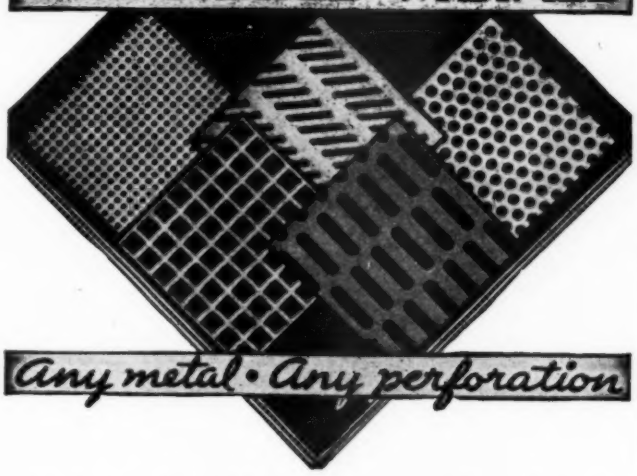

Any metal • Any perforation

H. & K. Perforated Metals are accurately made and embrace a great variety of perforations for use in screening, grading, ventilating and straining of different substances.

Tell us your requirements and we will send booklet showing actual sizes of perforation.

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THE BARNES BETTER BILT GAS FLOOR FURNACE

The BARNES BETTER BILT GAS FLOOR FURNACE is enthusiastically endorsed by many home owners and builders because of the simple, quick method of installation. It's merely a matter of cutting a hole in the floor and wall furnace-size—then presto! it goes in easily and with a minimum of muss or fuss.

And there are other important, money saving reasons why the BARNES BETTER BILT GAS FLOOR FURNACE appeals to so many builders. There's the heavy 16 gauge heating element—the slotted Port Bunsen type burner—the 26 inch overall depth which requires no pit, no basement—the new, neatly designed non-vision grill—the fact that it meets the latest rigid requirements of A. G. A. standards for safety, economy and efficiency—and the ten year guarantee that insures your investment.

GAS BARNES Better Bilt FURNACES

For further information on the Barnes Better Bilt Gas Floor Furnace write today

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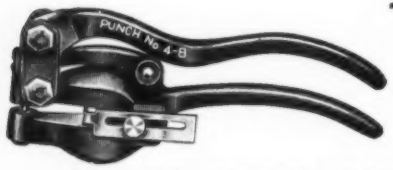
WHITNEY
LEVER PUNCHES



NUMBER FOUR "B" PUNCH

This punch for sheet metal work has a capacity of ¼" through 16 gauge. Weight 3 lb. Length 8½". Depth of throat 2". Complete tool includes three punches and three dies of specified sizes with die adjusting key. A time-saver for your up-to-date shop.

And here's another handy tool for the modern shop — the No. 2 Punch. Length 23". Capacity 5/16" through ¼" iron, weight 14 lbs., depth of throat 1-11/16". Punches and dies 3/32" to ½" by 1/64".

NUMBER TWO PUNCH

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.

who attended the convention. A committee consisting of Mrs. Louis L. Narowetz as chairman, Mrs. J. J. Haines, and Mrs. P. W. Olmen provided a program which included a tour of Chicago; the attendance at the Bowman Musical Milk Wagon Broadcast; a book review by the nationally famous Florence Burke Ellis; and a luncheon and fashion show at one of Chicago's large department stores. The ladies were also in attendance at the banquet and at one of the luncheons.

The Chicago convention committee, composed of P. W. Olmen as chairman, L. W. Rogers, E. B. Brown, Jr., J. J. Haines, Louis L. Narowetz, Lawrence Paul, William Kuechenberg, gave a cocktail party for members and visitors and the ladies on one evening and a splendid banquet with excellent entertainment and dancing at the conclusion of the convention.

Time Lag Floor Panel Systems

(*Continued from page* 72)

temperature of 80° F were assumed. The inside temperature at various times later was calculated and is shown graphically in Fig. 10 for two cases. In one the lower mass was assumed to be 105,000 pounds as was the case in the Solar Home calculations cited previously. In the second case a mass of 10,500 pounds was assumed. It is clear that the lag in the former case is intolerable since 30 hours are required to obtain a

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. . . to cash-in on the huge backlog of stoker sales! You increase your profits through faster sales, make fewer service calls by selling ECON-O-COL's complete line of precision-built, highest quality stokers. And a hard-hitting promotional program backs you up every step of the way! Details of our exclusive dealer franchise, now available in several areas, await your inquiry. Write or wire us today.

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The "Stronghearted" Stoker
BUILT BY COTTA TRANSMISSION COMPANY • ROCKFORD, ILLINOIS

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To Your SPECIFICATIONS

All sizes—accurately rolled to any diameter—complete circles or any part thereof—made in every dimension, furnished with or without bolt or rivet holes.

You'll appreciate this when you back them up or fit them on the job.

Used for reinforcing tanks, joining pipe or smoke stacks, installing air conditioning fans, and thousands of other uses.

Write for standard sizes and discounts.

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room temperature of 70° F. Whereas in the second case the depression of the indoor temperature is less than 3° F and persists for less than 6 hours. It is true that 6 hours is too long for a recovery period, but the reduction in mass is definitely effective and may be carried further in many cases.

Conclusions

On the basis of the theory developed and the experimental checks obtained, it is concluded that satisfactory prediction of floor panel heating system performance is possible although the calculations are laborious.

This study indicates that the amount of the lower mass is of prime importance in determining the inertial characteristics of the floor panel heating system.

Since it is important to reduce the amount of mass, below the ducts, which is influenced by the heating system, it is desirable to provide insulation as close below the ducts as is feasible.

A corollary of the theory is that the rate of change of outdoor temperature is not of great importance in determining the indoor temperature. This is a rather surprising fact which is borne out by the experimental measurements.

The characteristics of the operation of the floor panel heating system indicate the desirability of continuous operation to maintain constant temperature of the lower mass. A corollary of this is that the use of massive floor panels in Solar Houses is undesirable since the heating system does not operate during the day thereby permitting cooling of the lower mass,

Sell CLEAN AIR
—the year 'round with
RAYTHEON HOME PRECIPITATORS

"Slack" seasons are eliminated for dealers selling their customers Raytheon Home Precipitators. These dealers can show how desirable *clean* air is the *year 'round*, how it's easily and economically maintained with this versatile unit . . . and they know they can *depend* on deliveries from Proie & Coogan. Investigate today, we'll be glad to send literature.

We are distributors in Pennsylvania for Raytheon Precipitators in the following counties: Erie, Crawford, Mercer, Lawrence, Beaver, Washington, Green, Fayette, Westmoreland, Allegheny, Butler, Vanango, Warren McKean, Forest, Clarion, Armstrong, Somerset, Cambria, Blair, Clearfield, Elk, Cameron, Jefferson, Indiana.

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WHOLESALE DISTRIBUTORS FOR INDOOR COMFORT SUPPLIES • ROOFING MATERIAL
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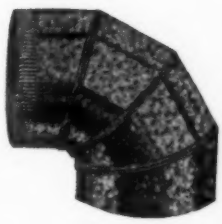
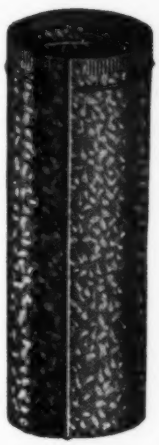
WARM AIR PIPE and FITTINGS



Warm air pipe and fittings are very important parts of your furnace installations, and the difference between a good job and a bad one is often determined by the kind of pipe and fittings used. Don't take chances on bad customer recommendation . . . install fittings from Ralph Supply and make your jobs *good* from the start. We make an honest effort to supply the finest obtainable parts, they'll FIT the first time, they're dependable and competitively priced. Write us today for more information on our complete line of warm air pipe and fittings . . . we'll send literature at once.



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QUICKCHANGE
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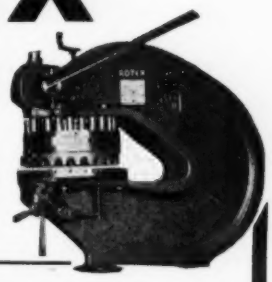

18 TIMES FASTER
Because:

Seventeen punches and 2" nibbling shears are mounted in revolving turret head ready for instant use. Punches range from 5/32" to 2".

THE ROTEX 18

has proved its worth in hundreds of small shops as well as in the huge plants of Douglas Aircraft, Fisher Body, R.C.A. Victor and other nationally known concerns. The Rotex 18 can do a faster, cleaner and more profitable job for *you!*

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ROTEX PUNCH COMPANY
4726 E. 12TH ST. OAKLAND, CALIF.

We Built a *Better*

ROTARY CONCRETE DRILL

COME ON NOW AND BEAT A PATH TO OUR DOOR . . !

- Makes concrete drilling easy.
- Drills concrete, brick, granite and marble
- Drills 85% faster than star drills.
- Drills precision holes; not deflected by rocks.
- Pulverizing action; no sharp point to wear.
- Used by leading contractors.
- Can be resharpened at nominal cost.
- For use in any rotating drill.
- All standard sizes. ¼" to 2". Larger sizes made to order.

WRITE NOW FOR PRICES.

See our Exhibit
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Rotary Concrete Drill Co.
650 South Arroyo Parkway
PASADENA 2, CALIFORNIA

Editorial

(*Continued from Page 57*)

examination of costs to determine if projects are worth while.

What to do about the situation right now is not too clearly in focus, but these basic moves would seem to be in order:

(1) An examination of all costs to see where reductions in cost may be obtained through more efficient operation and a greater return from the labor dollar.

(2) A thorough scrutiny of operations to disclose services now offered or work now done which can be omitted without sacrifice of any basic sales advantage.

(3) A re-analysis of the order books and an up-to-date check with customers to determine what orders are "water" or uncertain and what work is assured.

(4) A careful analysis of each activity to determine what activity is profitless and what activities require a disproportionate amount of time and cost.

(5) A cold-blooded analysis of the business as a whole to establish how much of a reduction in gross sales can be made before overhead is affected; how much overhead can be reduced before profits are affected; to the end that, if necessary, an equal profit or a satisfactory living can be obtained from a reduced gross volume of sales.

(6) An examination of sales and collection policies to determine what special techniques can be used to bolster sales; what needs to be done to accommodate an increase in time payment sales; and what system is needed to keep all collections liquid and current.

She Wants This Done Before She Cleans House!

Complete, modern chimney cleaning tools are standard equipment. They do it from the basement.

Clean furnaces, chimneys, now. Nice profit in the job plus orders for repairs and replacements — new grates — fire pots — even new plants. Line up your summer's work now and make money at the same time with the Super Red Streak Specialized Furnace Cleaner. Do as so many others have done—Write for a 5-day free trial and begin to do a bigger business with less work.

National Super Service Co., Inc.
1944 N. 13th St. Toledo 2, Ohio

MAPLEWOOD HUSKY-LITE COMBINATION MACHINE

20 Gauge Capacity - Immediate Delivery

A HUSKY—LIGHT WEIGHT ALL-PURPOSE MACHINE, made from SPECIAL ALUMINUM ALLOY. Weight (less standard) 15 lbs. Equipped with steel cut gears. Steel rolls (2" long) are machined, hardened, ground and keyed to fit shafts.

A large interchangeable gauge (3¼"x 2½") and handles for either top or bottom shaft permits clockwise or counter-clockwise operation.

BURRING
TURNING
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SINGLE BEADING
O. G. BEAD ROLLS
EDGE STRAIGHTENING
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COMBINATION CRIMPING AND SINGLE BEADING

SEE US FOR—

Pittsburgh Lock Machines, Roll Forming Machines, Roller Dies, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery.—Your inquiries invited.

MAPLEWOOD MACHINERY CO.
2634 FULLERTON AVE. CHICAGO, ILL.

Payroll Taxes Under Merit Rating

(*Continued from Page 61*)

If you offer a suitable job and the claimant refuses it, he will be partially or completely disqualified from receiving benefits. If he is disqualified for a fixed time, offer employment again at the end of that period. If a job remains open and he continues to refuse it, he may be completely disqualified as "unavailable."

Use of Independent Agency

Instead of hiring workers for a purely temporary job (e.g., end-of-year accountancy, special mailing), consider the possibility of having the work performed by an independent agency.

Note that the independent agency you engage should itself be a subject employer or you will gain no merit rating advantage in the following states: Louisiana, New Jersey, New Mexico, Oklahoma, South Carolina, Tennessee and Virginia. If the agency is not a subject employer, employees to whom it assigns your work may be considered your employees for unemployment tax purposes.

Hiring Veterans

There is a merit rating advantage in hiring veterans. If they should subsequently claim jobless benefits within the next year or two, they will probably receive

Make Your Humidifying Jobs Automatic and Trouble-Free!

National Plumbing Laboratory Approved Against Back-Siphonage

No. 5900-F WATER - BOY FEED VALVE furnished complete as illustrated.

Complete unit that enables you to convert any hand fed pan into an automatic humidifier. Easily and quickly installed. Thumb screw adjustment permits control of water line. Fully adjustable for varying water pressures. Reservoir outlet can be furnished on either side or end. Shipped with all necessary fittings and installation instructions. In every way a first-class, dependable outfit; corrosive-resisting, brass and copper construction—nothing finer to be had. And priced RIGHT for you to make a liberal profit.

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WRITE US TODAY for engineering data and prices on entire MAID-O'-MIST line which also includes complete automatic humidifiers and heating specialties of highest grade . . . or see your jobber!

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AUTOMATIC HUMIDIFIERS FOR ALL TYPES OF HEATING SYSTEMS

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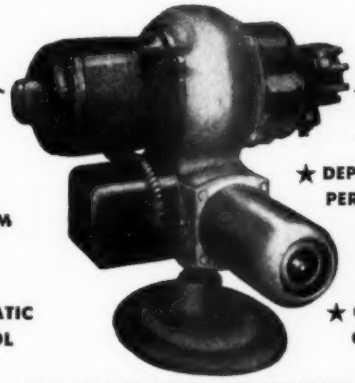

★ UNIFORM HEAT
★ DEPENDABLE PERFORMANCE
★ AUTOMATIC CONTROL
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Sell for MODERN Heat Homes

That's the story! If you intend to compete in today's market you'll have to sell a *modern* method of automatic heat. That's where the versatile Schwab Oil Burners enter the picture. We can supply a size and type for any installation and you know when you sell it that it's good for many years of dependable, healthful, automatic heat.

Made by Schwab with a background of 81 years continuous manufacturing experience . . . it has to be the ultimate of heating perfection. Sell modern heat for modern homes and increase your sales and profits. Write for literature and prices.

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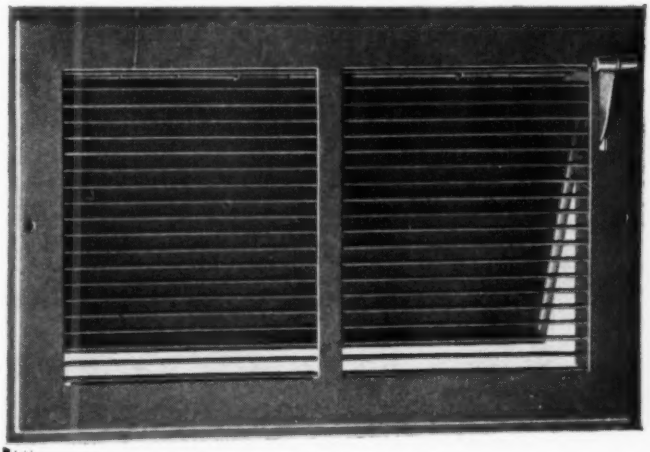

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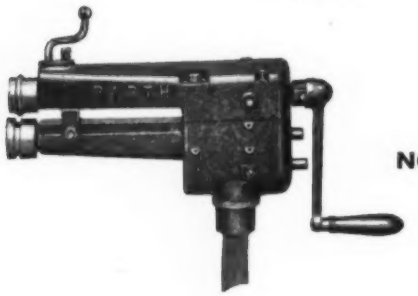

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DEEP THROAT COMBINATION MACHINE

(Patented)

Here is a sturdily built, all purpose machine for beading, crimping, burring, turning, wiring and flanging.

Its 22 gauge capacity and exceptionally deep throat, 8½ inches, permit a wide range of work. Special features include three drives and full gauging equipment.

THE BARTH MANUFACTURING CO.

MILLDALE, CONN., U. S. A.

BUILT For BETTER CLEANING

the GRAND RAPIDS deluxe FURNACE CLEANER

Model of the Doyle Vac-It

Built by men who understand the problems of furnace cleaning, the Grand Rapids Furnace Cleaner has been developed into a highly serviceable unit meeting all the requirements for faster, easier and more profitable cleaning:

DURABLE—COMPACT CONSTRUCTION • LIGHTWEIGHT ALUMINUM HEAD ASSEMBLY • HIGH POWERED MOTOR • 9" DIAMETER ROTARY FAN • LARGE CAPACITY HEAVY DUTY STEEL TANK • FLEXIBLE RUBBER CLEANING HOSE WITH 2" INSIDE DIAMETER • EFFICIENT OUTSIDE FILTER BAG • FREE ROLLING SWIVEL-TYPE CASTER WHEELS • ENGINEERED FURNACE CLEANING ATTACHMENTS.

Write today for complete information

Doyle VACUUM CLEANER CO.

227 Stevens St., S.W. Grand Rapids 7, Michigan

"readjustment allowances" under the GI Bill of Rights, and your account will not be charged.

Hiring Students

In many states there is special protection for employers who hire students. If you hire persons for temporary or part-time work whose principal occupation is that of a student, your merit rating account may never be charged with any benefits paid to them. Because the rulings on students vary widely from state to state, the employer should obtain his state's rulings and carefully study the regulations.

Lay-Offs vs. "Spreading" the Work

If it is necessary to reduce employment, consider spreading the work by reducing hours instead of laying off men. If acceptable to your employees, such a policy pays from a merit rating point of view. If the reduction in work is temporary, the plan may offer you complete merit rating protection. If the reduction in work is permanent, it can be coupled with efforts to place enough workers in other jobs so that full-time work will again be available to those remaining.

Note, however, that if spreading the work is to be a complete merit rating safeguard, each worker must receive enough each week to make him ineligible for partial unemployment benefits. If he receives less than this amount, he will be paid partial benefits and your merit rating will be only partially protected.

When Partial Benefits Are Denied

A worker may not receive partial benefits if he is

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TO FILL YOUR ORDERS FOR "E-Z-ON" DAMPER REGULATORS

RIGHT NOW, 30 to 60 days' delivery is the very best we can do in filling incoming orders for "E-Z-ON" DAMPER REGULATORS, in the face of the current overwhelming demand for these widely popular time and labor savers. It seems that furnace and heating contractors, everywhere, are constantly wanting more and more "E-Z-ON" Regulators!

DAYLIGHT AHEAD!

PRODUCTION is constantly gaining — inroads are being made on our tremendous backlog of orders — and it looks as if we can promise the normally prompt GERETT type of delivery service in the very near future. So thanks for your understanding patience.

M. A. GERETT CORP.

Metal Specialties Manufacturers

724 WEST WINNEBAGO STREET, MILWAUKEE 5, WISCONSIN

earning as much as his weekly benefit amount for total unemployment. This is the case in all states except the following, where the amount rendering a person ineligible for partial benefits is separately shown:

Indiana, Nebraska, New Jersey, Pennsylvania, Rhode Island, South Dakota, Vermont—the weekly benefit amount plus $3.

Delaware, New Hampshire and North Carolina—the weekly benefit amount plus $2.

Arkansas—6/5 of the weekly benefit amount.

Missouri—6/5 of the weekly benefit amount plus $3.

Texas—the weekly benefit amount plus $5.

Thus, if an individual whose weekly benefit amount is $18 earns $18 in a week of less than full-time work, he will not be eligible for any benefits. If his weekly benefit amount were $18 in a state which measured partial unemployment by the weekly benefit amount plus $3, he would have to be earning at least $21 to be ineligible for any benefit.

Lay-Off of Workers Hired Last

Try to lay off employees who have earned the least total wages in your employ (probably most recently employed). Generally, this will minimize the potential charges to your account.

Lay-Off of Fewer Workers for a Longer Time

If a reduction of employment is temporary and you have a choice between laying off a few workers for a longer time or many workers for a shorter period, *the merit rating advantage is in "fewer for longer."*

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You can save yourself time and money and make certain of well-tailored installations by contacting us for your pipe and fitting needs.

We are proud of our reputation and we want to help you fill your requirements with precision fittings . . . MADE-RITE. A postcard to us will bring you more information.

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PERFORMANCE PLUS!
ATH-A-NOR
Furnaces and Parts

* * *

Performance is the yardstick for measuring the efficiency of any heating plant, and those that will operate year after year with little or no attention are the ones which will return you the most profit.

You're sure of top drawer performance when you install ATH-A-NOR Furnaces and parts exclusively. Over fifty years of furnace manufacturing experience guarantee you home heating plants with performance ratings and lasting qualities to satisfy the most critical clients. Investigate now . . . write for literature.

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Manufacturers of Quality Heating Equipment for Over Fifty Years.
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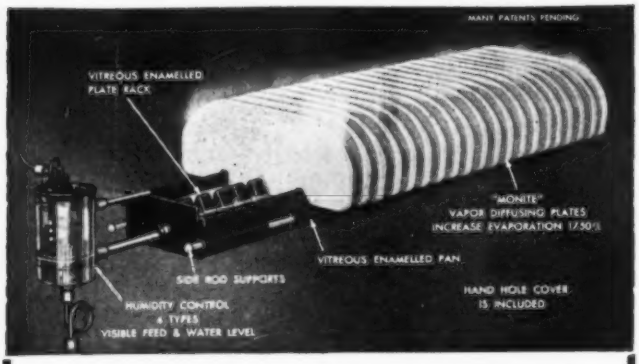
THIS AT-A-GLANCE OIL GAUGE IS 125 YEARS OLD!

IN POINT OF SERVICE

This record was accomplished at the 7th International Heating and Ventilating Exposition. In addition to its durability, the favorite expression of those who saw the AT-A-GLANCE GAUGE in operation was, "Simple, isn't it?" Right they were, for AT - A - GLANCE OIL GAUGES are made without gears, cams, springs, or magnets. Therefore, no parts of the AT-A-GLANCE OIL GAUGE can ever go wrong.

KRUEGER SENTRY GAUGE CO.
GREEN BAY, WISCONSIN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For healthful operation, every heating system, new or old, requires a dependable humidifier. In Monmouth, superb engineering and careful craftsmanship assure the finest device available. We make a complete line of humidifiers for all your needs:

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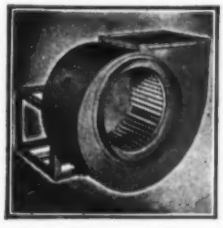

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Double Inlet and Single Inlet

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VENTILATING DIVISION

SCHWITZER-CUMMINS COMPANY

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In benefit wage ratio states, the advantage is certain; in other states, it is probable, since reemployment or disqualifications for unavailability or job refusal during the longer period of unemployment will surely keep charges down.

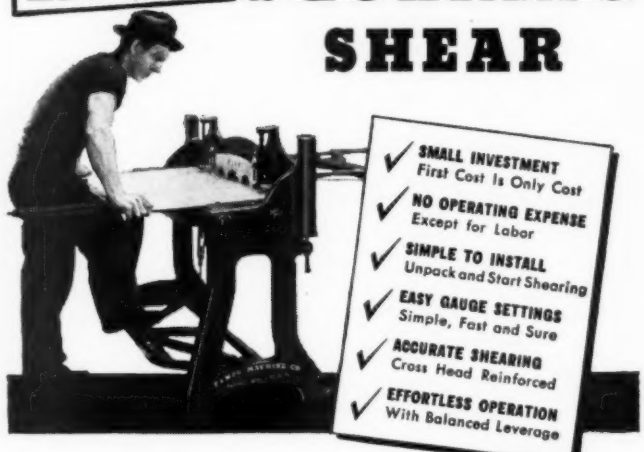
Kruckman— Washington Letter

(Continued from Page 59)

impression here is that the huge increase in export will make necessary allocations for foreign needs and for domestic distribution. This is expected to lead to more specific rationing, and to priorities. The overall increase is expected to make necessary domestic allocation of warehouse facilities, of transportation at home and on the seas. Prices are now on the way down; the buyer is able to get more his dollar. But with the impact of the Russian containment program, which will touch all basic supplies, it is expected prices will jump up again; and it is regarded as certain that this will force the Federal Government, to prevent the greater part of American goods from going abroad, to impose some form of price control. Most people in commerce and industry are wary of controls, although there is an increasing whisper from some business sources that controls were lifted too early, that their hasty removal has caused some of the recession. Whatever controls may come, it is considered probable they will be administered in a fashion similar to the manner in which the physician gives unpalatable medicine.

SIX REASONS WHY YOU'LL LIKE A

famco SQUARING SHEAR



Save on light shearing jobs by using Famco Squaring Shears. Ruggedly built of semi-steel, accurately machined, they do precision shearing of up to 18 gauge mild steel. Five cutting widths (22" to 52") have easy-to-set gauges. Write today for further details about the Famco line.

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famco (COST CUTTING) machines

ARBOR PRESSES • FOOT PRESSES • SQUARING SHEARS

They will be dolled up pleasingly, and coated with something that tastes good. In other words, following the good old FDR technique, the controls will be slipped into use with the idea that you will not realize what is happening until you have swallowed the dose.

Generally speaking, it is anticipated the control system will be back with us next Fall, possibly early in Winter, when the Russian containment program is expected to be flourishing healthily. The Government people say the time element is just right to enable the manufacturers to get into swing to fill pipelines; they anticipate the stimulus of the coming Truman prosperity will be very healthy for the industries based upon sheet metal, and particularly the warm air heating industry, in fact any industrial activity which supplies means of heating, and which makes the appliances used in connection with heating equipment. There is an especially insistent demand for all kinds of heating equipment from Sweden, and from Norway, Denmark, as well as from other parts of Europe. The Office of International Trade of the Department of Commerce warns that it will be wise to inquire about the export and import regulations of the specific country before attempting to do business. All foreign countries have rigid requirements compelling import permits; some require that the purchaser secure the permit before he buys; most of them also require that the buyer secure permission to use dollar exchange. In most of the foreign countries it is necessary to do business with some form of Governmental cartel. Even in England the transactions must be conducted through the

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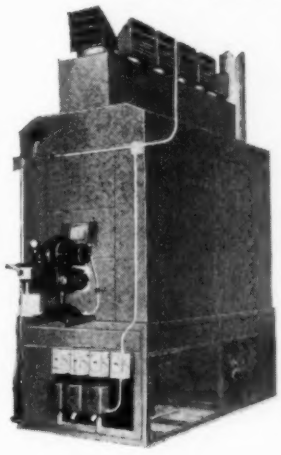

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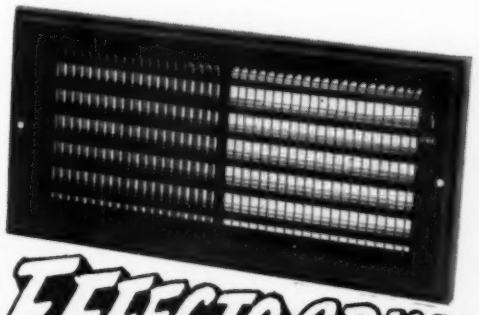

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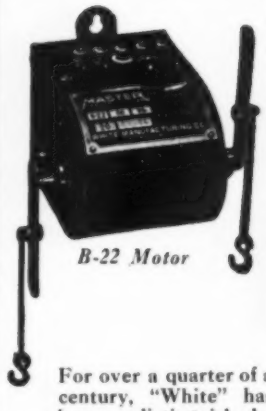
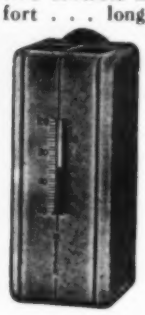


B-22 Motor



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For over a quarter of a century, "White" has been a distinguished name in the heating industry. Master Temperature Controls are famous for their greater comfort, more efficient service and longer life . . . factors which insure complete satisfaction for your customers and growing sales for you.

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Pioneers in warm air heating equipment for almost half a century.

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general supervisory interposition of the British Board of Trade. This Board of Trade is in no sense the same sort of organization we mean when we use the term. It literally is a Governmental organization which polices British trade and commerce.

The Civilian Production Administration unit which had charge of the allocations and regulations remaining, which affected heating and allied equipment has been transferred to the National Housing Administration. Don S. Brown, in charge of the unit the past year, remains at its head. He recently issued a statement to the industry, making clear that its functions and duties are unchanged. Except for the shift in overall administration, it is virtually the same as it has always been, even remaining in the same building, Temporary E. In the NHA it comes under the Building Materials Division, which is headed by Robert E. Johnson.

There is, of course, no more steel allocation; the only item currently under allocation is pig iron for soil pipe. Obviously, if the Greece-Turkey-Korea-etc.-program brings about the tightening that will require controls, the people of your industry will primarily be interested in sitting down with the officials of the Office of International Trade in the Department of Commerce. The OIT has regional representatives wherever there is a Department of Commerce office. If things develop as is anticipated, it is expected by some Government people that people from your industry and other industries again will be invited to come here to help the Government agencies to function

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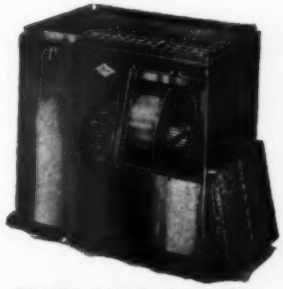

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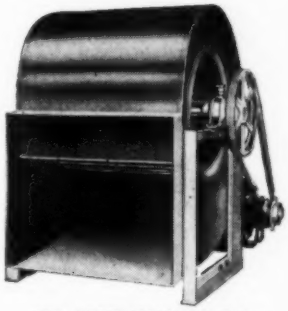
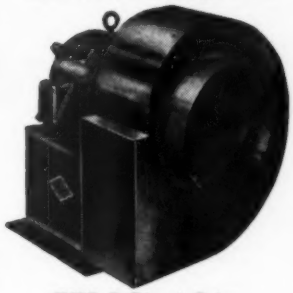


"B" ASSEMBLY Belt Drive



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Built for the HOME and OFFICE, and for STORES, FACTORIES and INSTITUTIONS.

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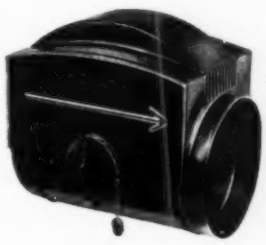

Model 406 — 6-inch (shown left). Fully automatic . . . positive, trouble-free action . . . built-in damper . . . self-lubricating bearings . . . Highy efficient. A precision built control for complete customer satisfaction.

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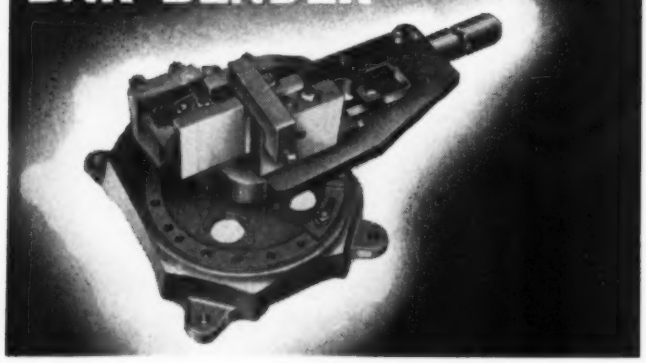

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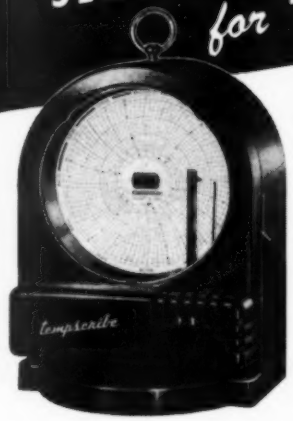

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DEMONSTRATES THE HEATING COMFORTS THAT WILL RESULT FROM THE RECOMMENDED IMPROVEMENTS!

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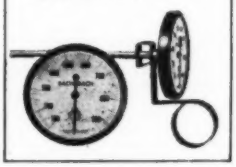
Ideally suited for checking temperature of flue gas, as well as in warm air ducts and at register outlets for balancing heat distribution.



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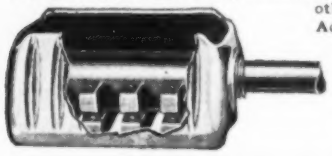

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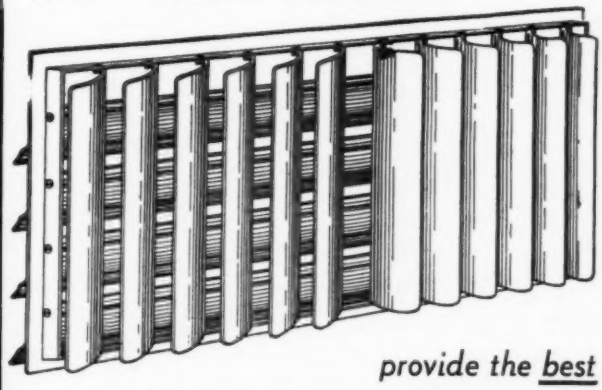

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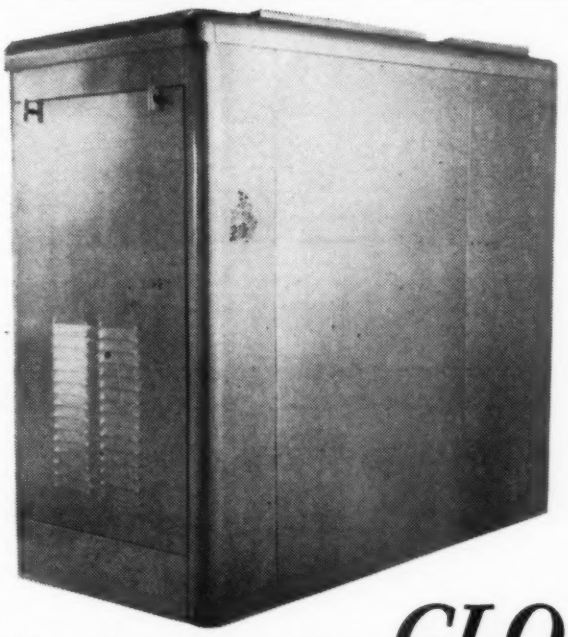

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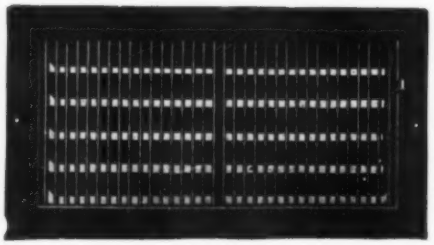

Air-Vane Registers are strongly constructed with vertical or horizontal vanes for right or left downward deflection of air flow. Multi - Louvre dampers for closing and 15 degree downward directional air flow standard. These fine registers are also available with single louvre in wall and baseboard registers. Grilles and intakes in all standard warm air pipe sizes. Large and special sizes can be furnished on request.

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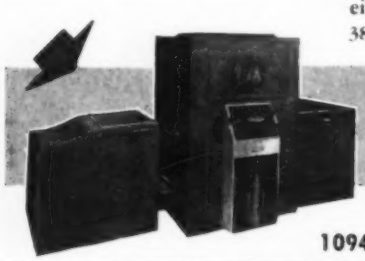
2435 Fifth Avenue — Rock Island, Illinois

after much the same manner as they helped them to operate during the war. It is difficult to point out with any accuracy which agencies will be devoted to your needs. Undoubtedly new functions may be focused in the Department of Commerce as well as in the National Housing Administration. It is not clear who may handle domestic allocations, priorities, price controls, and similar functions. There is a substantial element in the Government who expect that, to all intents and purposes, most of the economic operations of Government during the war will be resumed; another group does not expect that this development will cause the recall of people from industry.

There seems little prospect, immediately, of new controls over housing, either in NHA or elsewhere.

EFFICIENT HEAT *without* CLINKER NUISANCE *in the* NEW *Majestic* STOKER FURNACE

This smartly designed, rugged unit is tops in home-heating service, convenience, and economy. Special crown radial fins boost heat output. Inner can permits clean, easy clinker disposal. Any domestic stoker fits either side. It's a Majestic climax to 38 years' experience in heating.



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For GRAVITY or FORCED AIR SYSTEMS

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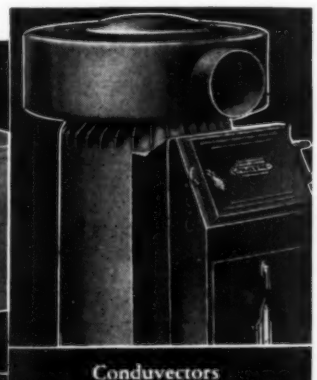

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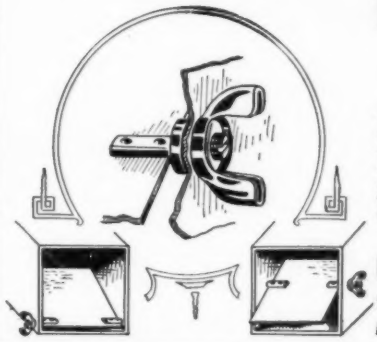

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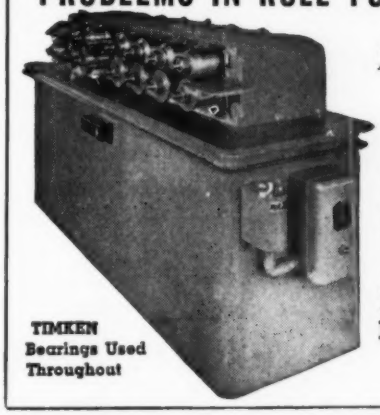

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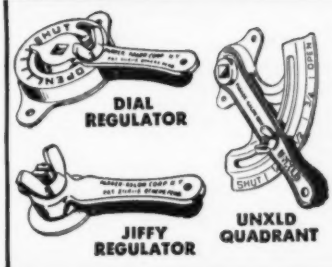

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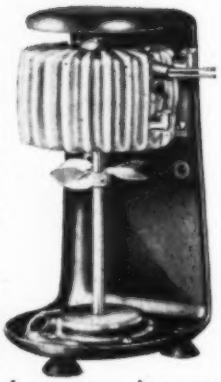

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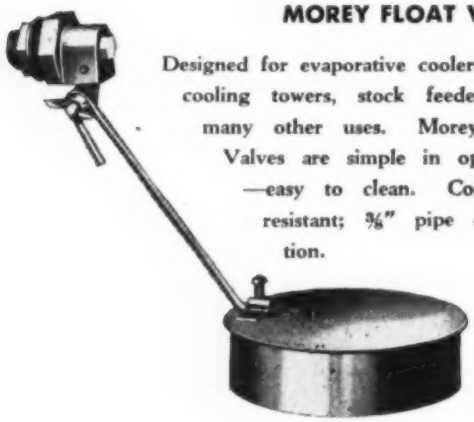

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We are told that industrial mobilization under the Armed Services is actually functioning. Production in some plants has been speeded up. There do not seem to be indications, however, that mobilization has yet

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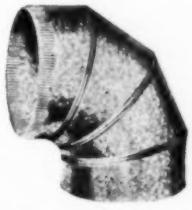

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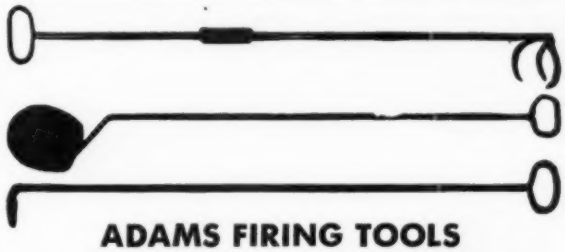

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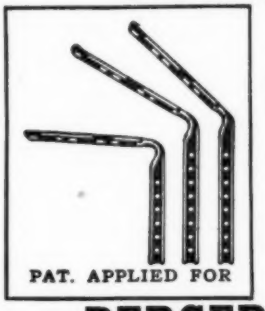

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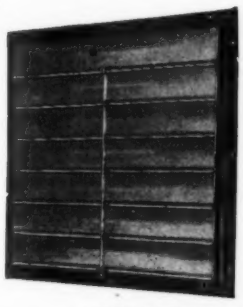

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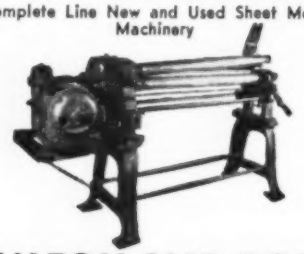

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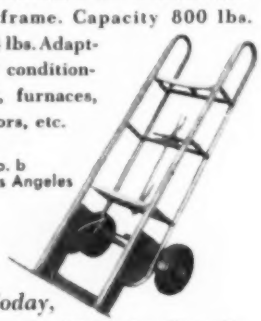

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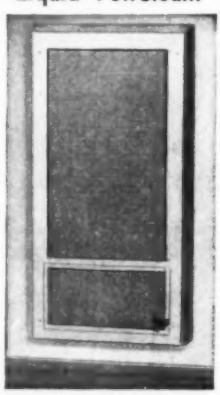

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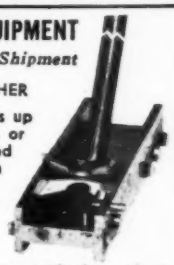

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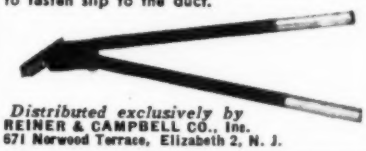

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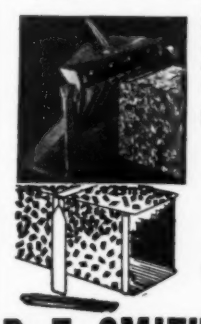

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SERVICE SECTION

Rates for display space in the Service Section are $7.00 per inch per insertion. One-inch minimum space accepted.

Index to ADVERTISERS

Acme Electric Welder Co. 176
Acme Equipment Company 170
Adams Co., The 175
Aerofin Corp. 114
Air Controls, Inc. 157
Air Control Products, Inc. .....Inside Front Cover
Air Devices, Inc. ..... *
Air Products, Inc. ..... *
Airtemp Div. of Chrysler Corp. 103
Airtherm Mfg. Co. 150
A-J Mfg. Co. 171
Ajax Furnace Fitting Co. ..... *
Allen Co., Inc., L. B. 174
Alton Mfg. Co. ..... *
American Brass Co. 28
American Machine Products 171
American Metal Products 147
American Radiator & Standard Sanitary Corp. 111
American Rolling Mill Co., The 126
American Smelting & Refining Co. .. 46
Anchor Post Products, Inc. 119
Anemostat Corp. of America 123
Armstrong Co., The ..... *
Audel & Co. ..... *
Auer Register Co. .....107 & 176
Automatic Burner Corp. ..... *
Automatic Humidifier Co. 141
Automatic Products Co. 155

Bacharach Industrial Instrument Co. 170
Barber Colman Co. 55
Barber Gas Burner Co., The 175
Barcafer Mfg. Co. 178
Barnes, Inc., H. C. 159
Barth Mfg. Co. 164
Bayley Blower Co. 173
Berger Bros. Co. 175
Bethlehem Steel Co. 52
Beverly Shear Co. 176
Bishop & Babcock ..... *
Black & Decker Mfg. Co. 138
Brauer Supply Mfg. Co., A. G. 176
Breuer Electric Mfg. Co. 172
Bremil Mfg. Co. ..... *
Brooks Co., Inc., B. D. 179
Brundage Co. 159
Bryant Heater Co. 54
Burden Co. 133

Carnegie-Illinois Steel Corp. 14
Century Electric Co. 34
Century Engrg. Corp. 15
Certified Furnace Co. ..... *
Char-Gale Mfg. Co. .....20 & 21
Cheney Inds. 174
Cherry Rivet Co. 124
Chicago Steel Furnace Co. 167
Clarage Fan Co. 117
Clayton & Lambert Mfg. Co. 48
Cleveland Humidifier Co. 166
Cleveland Steel Products Co. ..... *
Cole-Sewell Engineering Co. 169
Colson Equip. Supply Co. 178
Columbia Burner Co., The 170
Columbia Steel Co. 14
Conco Engineering Works 42
Condensation Engineering Corp. 136
Connor Engrg. Co., W. B. ..... *
Consolidated Industries, Inc. ..... *
Coroaire Heating Corp. ..... *
Cotta Transmission Corp. 160
Crandall Mfg. Co. 178
Crescent Tool Co. 45

Dahlstrom Machine Works 173
Damascus Steel Products Corp. 173
Des Moines Stove Repair Co. 157
Detroit Lubricator Co. 42
Doyle Vacuum Cleaner Co. .....164 & 179
Dravo Corp. 129
Dreis & Krump Mfg. Co. 173
Dresser Industries (See Bryant Heater Co.) ..... *

Effecto-Grille Co. 167
Elgo Shutter & Mfg. Co. 175
Enderle, Inc., Ltd., Frank X. 177
Evans Products Co. 115

Famco Machine Co. 166
Federal Machinery Co. 178
Field Control Div., H. D. Conkey & Co. ..... *
Fireline Stove & Furnace Lining Co. 118
Fisher Brass Fdry. ..... *
Fitzgibbons Boiler Co., Inc. ..... *
Follansbee Steel Corp. ..... *
Frayn Co. 179
Front Rank Furnace Co. ..... *
Furblo Co. 149

Gallaher Co. 174
Gelert & Co., C. R. 106
General Controls 53
General Electric Co. 158
General Filters, Inc. ..... *
Georgen-Mackwirth Co., Inc. 12
Gerett Corp., M. A. 164
Gilen Co., J. L. 175
Glo Distributing Co. 171
Goese Mfg. Co. 173
Grand Rapids Die & Tool Co. 169
Great National Air Cond. Co. 169
Gray, G. L. 177

H. & H. Research Co. ..... *
Hall-Neal Furnace Co. 40
Harrington & King Perforating Co. .. 159
Harris, A. R. 176
Hart & Cooley Mfg. Co. 8
Harvey-Whipple, Inc. 31
Hasko Utilities Co. 179
Heatcraft Co. 168
Heil Co. ..... *
Henry Furnace Co., The 47
Hess Warming & Ventilating Co. .... *
Holcomb & Hoke Mfg. Co. 41
Holly Mfg. Co. 122
Hopwood & Assoc., Inc., J. W. ..... *
Hussey & Co., C. G. 16

Illinois Testing Laboratories, Inc. ... *
Independent Register Co. 144
International Metal Products Co. .... *
Interstate Machinery Co. ..... *

Jackson & Church Co. 104
Johnson Company, S. T. ..... *
Juniper Elbow Co., Inc. ..... *

Kehm Corp. 153
Kling Bros. Engr. Works 152
Knights Co., The James 170
Krauser-Boyd, Inc. 172
Kresky Mfg. Co. 145
Krueger Sentry Gauge Co. 165

Langsenkamp Co., F. 175
Lau Blower Co. ..... *
Libert Machine Co. 167
Lincoln Electric Co. 131
Lockformer Co. 17

Made-Rite Furnace Pipe & Fitting Co. 165
Maid-O'-Mist, Inc. 163
Majestic Co. 172
Maplewood Machinery Co. 162
Marine Mfg. Co. 137
Marshalltown Mfg. Co. ..... *
Maurey Mfg. Co. 10
May-Fiebeger Co. 165
McConnell, Inc., R. A. 179
McDonnell & Miller, Inc. ..... *
Mercoid Corp., The 37
Meyer & Bro. Co., F. ..... *
Meyer Furnace Co. 9
Midco Register Corp. 163
Milcor Steel Co. 78
Miller & Doing 173
Milton Equipment Co. 178
Minneapolis-Honeywell Regulator Co. .....Inside Back Cover
Morey, Dan 174
Morrison Products, Inc. ..... *
Morrison Steel Products, Inc. 49
Mt. Vernon Furnace & Mfg. Co. 172
Mueller Furnace Co., L. J. 51
Mulkey Co., J. F. 130

Naco Mfg. Co. 156
National Metal Fabricators 160
National Super Service Co. 162
Nelson Corp., Herman .....24 & 25
Niagara Furnace Div. of the Forest City Foundries Co. 139
Niagara Machine & Tool Works 145
Norge-Heat Div., Borg-Warner Corp. *
Norman Products Co., Inc. 44
Nu-Way Corp. ..... *

Olsen Mfg. Co., C. A. 22
Omaha Stove Repair Works 174
Owens-Corning Fiberglas Co. 32

Palmer Mfg. Co. 132
Paragon Elec. Co. 157
Parker Mfg. Co. ..... *
Parker-Kalon Corp. 173
Patten Co., J. V. ..... *
Peck, Stow & Wilcox Co. 149
Peerless Foundry Co. 168
Penn Boiler & Burner Mfg. Co. 109
Penn Electric Switch Co. 23
Perfex Corp. 50
Petroleum Equipment Co. 176
Petroleum Heat & Power Co. 38
Plasteel Products, Inc. 30
Potts-Farrington Co. 179
Power Engrg. Co. 120
Premier Furnace Co. 146
Proie & Coogan Heating Co. 161
Pryne & Co., Inc. ..... *

Quiet Automatic Burner Corp. ..... *
Quaker Mfg. Co. 143

Radiation Furnace Co. 154
Ralph Supply, Inc. 161
Randall Graphite Products Corp. 157
Register & Grille Mfg. Co., Inc. ..... *
Reiner & Campbell Co., Inc. 179
Reinhard Bros. Co. ..... *
Republic Steel Corp. 26
Research Products Corp. .....Outside Back Cover
Revere Copper & Brass, Inc. 87
Rheem Mfg. Co. .....11 & 125
Richmond Radiator Co. 113
Riverside Machine Company 142
Rock Island Register Co. 172
Rotary Concrete Drill Co. 162
Rotex Punch Co. 161
Round Oak Corp. ..... *
Royal Heaters, Inc. 13
Rudy Furnace Co. ..... *
Rybolt Heater Co. 18
Ryerson & Son, Inc., Joseph T. 56

Sall Mountain Co. 5
Sampsel Time Control Co. 6
Schaefer Brush Mfg. Co. 88
Schild Mfg. Co. 176
Schwab Furnace Co. 177
Schwab Safe Co. 163
Schwitzer-Cummins Co. 166
Skilsaw, Inc. 147
Skuttle Mfg. Co. 135
Smith, R. E. 179
Standard Stamping & Perforating Co. *
State Supply Co. 175
Stewart Mfg. Co. 151
Superior Products Co. 171
Swartwout Co. 155
Syncromatic Corp. 7

Tennessee Coal, Iron & R. R. Co. 14
Thatcher Furnace Co. 27
Thermac Company 116
Thor Metal Products, Inc. 175
Timken-Detroit Axle Co. ..... *
Tinit Mfg. Co. 172
Topflight Tool Co. 179
Trade Winds Motor Fans, Inc. 148
Triangle Mfg. Co. 150
Tuttle & Bailey, Inc. 112

Union Mfg. Co. 169
U. S. Air Conditioning Corp. ..... *
United States Register Company 140
United States Steel Corp. 14
United States Steel Export Co. 14
United States Steel Supply Co. 14
Utility Appliance Corp. ..... *

Viking Air Conditioning Corp. 128
Viking Mfg. Co. 36
Vital Products Mfg. Co. 179

Ward Machinery Co. 177
Waterman-Waterbury Co. 66
Webb Machine & Tool Co. 153
Webster Electric Co. 39
Weirton Steel Co. 35
Weldex, Inc. ..... *
Wells Mfg. Co. ..... *
Western Engrg. Co. 173
Wheeling Corrugating Co. 33
White Mfg. Co. 168
White-Rodgers Electric Co. ..... *
Whitney Metal Tool Co. 159
Whitney Mfg., W. A. 160
Wise Furnace Co. ..... *
Williams Oil-A-Matic Division, Eureka Williams Corp. 121
Williams Radiator Co. 178
Williams-Wallace Co. 169
Williamson Heater Co. 127
Wilson, Inc., Grant ..... *
Wilson, K. R. 29
Wilson & Co., Inc. 3
Wise Furnace Co. ..... *
Wodack Electric Tool Co. 179
Wolff & Co., Benjamin ..... *
Wysong & Miles Co. 19

Zink, John, Co. 141

Firms represented in this issue are identified by the folio of the page on which their advertising appears. Advertising which appears in other issues is marked with an asterisk.

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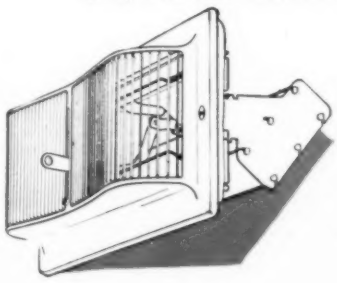

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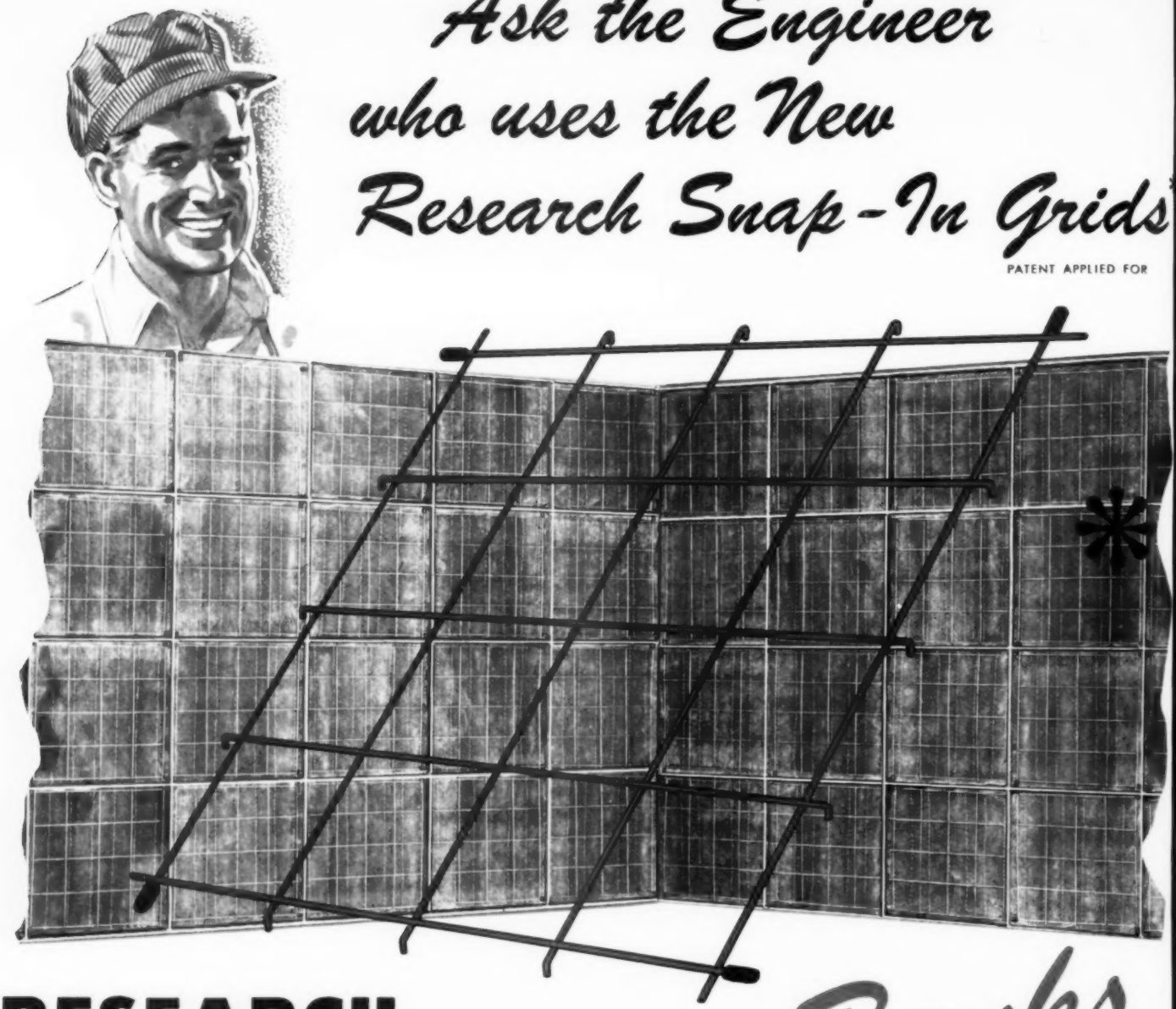

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